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## THE MALARIAL THERAPY OF NEUROSYPHILIS OTHER THAN UNCOMPLICATED DEMENTIA PARALYTICA*


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AND
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The malarial treatment of dementia paralytica was introduced in the University Hospital in 1927. At the outset this form of treatment was used solely for patients suffering with dementia paralytica; later, good results having been observed in dementia paralytica with tabes, it was used in other types of cerebrospinal syphilis to determine its possible effects. It is our purpose in this paper to discuss in detail this group not having uncomplicated dementia paralytica and to note the results obtained.

This subject has been studied in various countries by Schamberg,[1] O'Leary,[2] Nonne,[3] Driver,[4] Goldsmith,[5] Ebaugh,[6] Shields,[7] Matz,[8] Harris,[9] Reese,[10] Porteus,[11] Dods Brown,[12] Dreyfuss and Hanau,[13] Bering,[14] Kyrle,[15] Paulian,[16] Gougerot,[17] Rieux,[18] and Miniovitch,[19] among others.

Three types of patients were studied: those with frank tabes, those having dementia paralytica with tabes, and those with the diffuse type of syphilis of the central nervous system, including a small group in whom malarial treatment was started while they were in the secondary stage. A careful attempt was made to diagnose sharply in all these cases. No diagnosis was based on laboratory evidence alone; for example, a high middle zone curve was by no means taken as an indication that the patient was actually or necessarily even potentially tabetic.

Selection of patients was at times based on the fact that other methods of therapy had not been sufficiently productive of results; in other cases the malarial therapy was used as a measure adjuvant to other forms of therapy; in yet others the treatment was employed as a prophylactic measure with a view to giving the patient the benefit of all known forms of therapy to prevent later possible serious cerebrospinal accidents. The patients with secondary syphilis must be regarded as an experimental group. For the most part they received treatment early in 1927, this measure having since been abandoned as too uncertain and too unsafe as a measure protective to others.

Careful examination of the patient as to his physical status was a prime requisite; obviously poor risks were not considered for this type of treatment. Examinations were made also by the departments of ophthalmology and neurology as a routine; medical examinations, with especial reference to the heart, were obtained in all cases in which this was deemed advisable. Laboratory procedures, in addition to the examination of the blood and spinal fluid, were blood counts, urinalysis, phenolsulphonphthalein test and determination of nonprotein nitrogen. In 1928 the Kahn test replaced entirely the Wassermann test; therefore most of the patients were examined by the Kahn procedure. It is believed that differentiating between the two tests would serve only to complicate the issues of this paper; therefore Kahn and Wassermann tests will be referred to hereafter as "the serologic reactions." As the specificity of the colloidal gold reaction is doubted, reference will be made to first and middle zone curves, and not to "paretic" and "tabetic" curves.

During the time of receiving the malarial course, constant nursing observation and care, as well as a

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* Studies and Contributions of the Department of Dermatology and Syphilology of the University of Michigan Medical School, service of Dr. Udo J. Wile.

* Read before the Section on Dermatology and Syphilology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

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twice or thrice daily checking up by the resident physician on the service, are important reasons for low mortality of malarial patients at the University Hospital. In the group under present consideration there was no death directly attributable to the malarial therapy.

Inoculation was made intravenously, with from 2 to 10 cc. of blood taken, if possible, from a patient at the height of a malarial paroxysm, this being repeated if needed. The disease was of the usual tertian type, occasionally taking on double tertian characteristics. The period of incubation varied from three or four days to two or two and a half weeks. The strains seemed to increase in virulence the longer they were used. The use of intravenous typhoid injections was occasionally resorted to; it was discovered in many cases that this served to hasten the onset of malarial paroxysms. The number of chills permitted depended to a great extent on the condition of the patient, but it has been the recent tendency to diminish the number of paroxysms. The first patients were given sixteen chills; of late, following the personal recommendation of Wagner von Jauregg,[20] eight elevations have been considered the optimum. Quinine was then administered by mouth or intravenously, or by both means, until the paroxysms had been controlled; patients were then discharged with quinine for a three month interval, as a rule without treatment.

Check-up examinations were made by the dermatology, ophthalmology, neurology and, at times, the medical departments. A spinal fluid examination was done when possible. Examinations have been repeated at intervals of from three to six months. Unfortunately, it has not been possible to have all the patients return for reexamination; some of them have in fact disappeared, or letters requesting their return have been disregarded. This paper treats of immediately obtained results, supplemented by later observations on the patient as far as these could be made.

### IMMEDIATE RESULTS OF TREATMENT

In many of the patients studied it was possible to observe immediate effects, which were in some cases beneficial, in others definitely detrimental. In the remainder there was no obvious change. An evaluation of early results is of especial interest to us, but subsequent observations show that they are not entirely to be relied on. Comment will be made on the relation of height of fever to results, also the fact that serologic reversal is not of especial prognostic value.

In all groups lack of early therapy, or inadequate therapy, was evident. In a few cases, however, serious complications developed in the face of thorough early treatment.

*Tabetic Group.*—In this group there were nineteen patients who may be regarded as having frank tabes, eighteen men and one woman. It is to be observed that the average age is below middle life, varying from 28 to 53, with an average of 42. The duration of infection in known cases varied from four to thirty years, with an average of fifteen years. The duration of infection was unknown in five cases. Early treatment was absent in eleven of the patients, inadequate in five, dubious in one and, according to ordinary standards, very good in one case only.

The clinical observations in this group were typical for tabes dorsalis in all cases; that is, broadly speaking there were pupillary changes, some ataxia and diminished to absent reflexes. In two cases the tabetic type of pain was the predominant feature. In four, gastric crises were most complained of. Incontinence was noted in four patients. Three made complaint of impotence, a symptom which is not always inquired into. Two, while quite definitely tabetic, had hyperactive reflexes. Unusually marked ataxia was present in one and in another a Charcot joint.

The serologic reactions on these patients showed the features that might be expected of this group. There was a high percentage of negativity. Of nineteen blood tests, seven were negative and twelve positive. The spinal fluid reactions did not correspond as a rule. The reactions were negative and doubtful on blood and spinal fluid in a case in which the signs of tabes, together with definite gastric crises, were present. Cell counts varied from 0 to 87, and the average was 16, unusually high cell counts for patients with tabes. Spinal fluid solids were increased in most cases to a slight extent; that is, in all but two cases the solids were one or two plus, in one case three plus, but in no case was there a very marked increase in solids. The colloidal gold curve was predominantly of the middle zone type; five had 3's in the middle zone; seven had 2's, while three had 1's only; five had a first zone type of curve, which was in one case as high as 4, in the rest 3.

The number of chills varied from three to nineteen, with an average of ten chills. The fever varied from one case which averaged 103 F. to two in which the chills averaged 106. The mean was from 104 to 105 F., mostly 105. Three patients showed liver symptoms during the malarial therapy; two were jaundiced, and one had merely an enlarged liver. These difficulties cleared up before the patients were discharged. One typically tabetic patient became confused during the treatment.

The immediate results of therapy were of considerable interest. Ten patients had symptomatic improvement. One of these actually gained 6 pounds (2.7 Kg.) during treatment. In three, gastric crises were arrested. In two the ataxia was no longer a chief complaint. In one individual the incontinence was stopped. All ten testified as to the definite and immediate improvement they enjoyed. One showed absolutely no improvement, and one was definitely impaired by the fever therapy. The patient who became confused remained somewhat confused up to the time of discharge.

Check-up spinal fluid examinations were done in fifteen cases. In two patients the serologic change on the spinal fluid was from three and four plus to negative. In one case a doubtful reaction became negative. In one case a three plus reaction became two plus. In nine cases there was no change. One negative test became three plus. There was a marked effect on the pleocytosis. In those fluids which were unusually high in cells a marked reduction was noted in every case: 87-4, 33-6, 71-1, 14-8. Solids did not change significantly. Some interesting changes were noted in the colloidal gold curve: seven remained approximately the same; three changed from the second to the first zone; one from the first to the second zone; one second zone curve became normal; one showed less intensity in the middle zone, and two showed higher figures than before. There was no relation between the amount of symptomatic improvement and the curves, as for example in the last two cases, in which

20. Personal communication to Dr. Udo J. Wile.

improvement was attended by increase in the intensity of the colloidal gold reaction.

*Group of Dementia Paralytica with Tabes.*—In this group there were forty-five patients, two of whom were women. The ages of the patients varied from 30 to 53, with an average of 42. As in the first group, the average is below middle life. The duration of infection was unknown in thirteen cases, and in the remainder it varied from five to thirty years, averaging fifteen, which corresponds to the group of patients with frank tabes. Early treatment was not given to twenty-six of the group; one had local therapy only; one had mercury rubs for a short time; four were given some kind of medication by mouth; eight had one, two or three injections of an arsenical, and of these apparently only one had received mercury. Only two patients had six injections; one had fifteen; one had fifty injections of neoarsphenamine; none of these had mercury or bismuth. One patient had what he termed "shots."

The observations in this group of patients are those of mixed dementia paralytica with tabes; of dementia paralytica with tabes, with signs and symptoms of tabes predominating; and of dementia paralytica with tabes, with signs and symptoms of dementia paralytica predominating. In the first group of twenty definitely mixed types, optic atrophy was an additional complaint of three, incontinence or retention of four, crises and tabetic pains of two, dysarthria of one, and one patient suffered from palsy of the third and fourth nerves. The group that was predominantly tabetic numbered twenty. Further complaints consisted of optic atrophy in one, incontinence or retention in two, dysarthria in one, loss of memory in one, while one complained of a nervous breakdown. In the group in which dementia paralytica predominated there were five; three of these had root or gastric pains, and one had symptoms of tabes and signs of dementia paralytica.

The original serologic tests on the blood of these individuals showed a stronger tendency toward positivity than the preceding group. It may be said in general that there was no especial relationship between the amount of positivity and the magnitude of the disease process. Thirty-eight blood tests were positive and seven were negative. The degree of positivity of the blood and spinal fluid tests did not necessarily correspond. The spinal fluid reaction was positive in forty-two, negative in one and doubtful in two cases. The cell count varied from 0 to 128; red blood cells were accidentally obtained in two cases, and no spinal fluid examinations were obtained in another. The average of the cell counts was 25. A more marked increase in solids was to be seen in this group than in the former; in most cases it was not very high but in eight cases, four plus globulin and albumin were considered present. The middle zone type of colloidal gold reaction was present in fourteen cases, the first zone type in the remainder. In general, the curves were rather more definite than in the tabetic group.

The number of chills administered varied from five to sixteen, with an average of eleven. The height of these varied from 103 to 107 F., mostly 104 or 105. Untoward reactions during treatment were rather common in this group; one patient who had not previously complained of gastric crises developed serious ones; one had epileptiform seizures; one had delusions; two were unruly; two became maniacal, and one actually attempted suicide. In one the ataxia and incontinence were made much worse. One patient developed purpura. These reactions, for the most part, subsided previously to the patient's discharge. In one patient, intravenous typhoid injections were required to stir up malarial paroxysms; in another the malaria was aborted after five chills, and the patient was then given three typhoid injections.

Check-up examinations of the spinal fluid were done on thirty-nine of the patients. There were thirty-three positive, two doubtful and three negative reactions. Changes were noted in six of these reactions. Two positive reactions increased in positivity, and four reactions showed a lessened positivity. In two cases in which the test became more positive, improvement was noted; in two in which a greater negative tendency was observed the patients became worse. The cell count was in all cases reduced, varying from 0 to 25, with an average of 9 cells. Solids were reduced in all cases but two, in which there was an increase.

The colloidal gold reaction remained essentially the same as before treatment in twenty-four of thirty-eight patients. In two cases the curve changed from first zone to second; two first zone curves became negative; two showed fewer figures, one more. No first zone curves became flat, whereas two showed greater, two less intense reactions.

Fourteen of the patients improved symptomatically immediately following treatment. Eleven patients showed doubtful if any improvement. Ten were definitely worse; in eight of these the symptoms of dementia paralytica became more marked than before; in the other two the pains became worse. No definite opinion was expressed about the other ten patients.

*Syphilis of the Central Nervous System (Diffuse Type).*—In this group there were represented types of syphilis of the central nervous system that could not be classed definitely as tabes, dementia paralytica with tabes, or dementia paralytica. The cases include an interesting group of six patients who were first examined in the secondary stage; a patient who showed a neurorecurrence together with recurrent secondary syphilids, and another who showed a neurorecurrence one month following apparent cerebrospinal negativity. Three patients had had epileptic seizures; one a hemiplegia; one an ulnar neuritis. The remaining cases were of the diffuse type, producing in some patients rather vague signs and symptoms, in others more definite ones, varying from mere hyperactive reflexes to definite palsies.

Of the thirty-two patients here considered, twenty-one were male and eleven female. The ages varied from 10 to 53, averaging 29. The duration of infection varied. Six cases were seen in the secondary stage; one was a recurrent secondary infection, coming on about a year after treatment; in one a neurorecurrence developed one month after thorough treatment of the primary stage. Four patients were dubious about the age of their infections, believing them to be six, eight, ten and twenty-seven years, respectively. The remainder of the group believed that infection had taken place from two to thirty years previously, with an average of nine years.

Early treatment was of interest in this as in other groups. In the six frank secondary cases, with one exception, treatment had not been given; in the other two early cases, thorough treatment had been given. Of the remaining patients, sixteen had received no treatment whatever. One received some sort of medication by mouth, doubtless pills of mercury. Three patients had received from one to three injections;

five had received reasonably good treatment, which was nevertheless deficient in heavy metal therapy.

The symptoms and signs varied greatly. The early group showed florid secondary syphilis and either an essential type of alopecia, leukoderma colli or both. Headache was a chief complaint in most. One patient had a stiff neck; this patient had in fact all the evidence needed for a diagnosis of a severe meningitis. The patient who had been seen a month previously in the primary stage had had no neurologic signs and had been thoroughly treated, but he returned, complaining of severe headache and dimness of vision. The latter was found to be due to a neuroretinitis and he had in addition hyperactive reflexes and slight mental deterioration. The formerly negative spinal fluid had become markedly positive, showing a positive Kahn reaction, increased solids and 760 cells. The patient who showed a recurrent florid secondary syphilis had in addition lost 20 pounds (9 Kg.), complained of headaches, and showed sluggish pupils and markedly hyperactive reflexes. In the remainder of the group, symptoms and signs showed great variation. Twitching of muscles, dizziness, nausea, slight ataxia, dysarthria, hemiplegia, ulnar neuritis and uncontrolled "sighing" were complained of in one case each. Possible retention occurred in two cases; various pains were complained of four times, and headache four times. Three had epileptiform seizures. Ten had various types of ocular conditions, varying from pupillary changes to optic atrophy. One had nystagmus. The reflexes were increased in twenty, decreased in two and normal in four. Two of the patients had congenital syphilis.

The blood test was found to be positive in thirty cases, doubtful in one, and negative in one case. The spinal fluid serologic reactions were found to be positive in thirty-one and doubtful in one case. The cell count varied from 0 to 750; other high counts were 551, 310, 250, 134, 100, 94, 65, 52, 48, 32 and 25. The highest cell counts were found in this group, as might be expected. There was an increase in solids in twenty cases, an occasional one plus occurring in the remainder. Nine patients showed first zone gold curves, fourteen showed second zone changes; the remaining curves showed changes represented by 1's and 2's.

The number of paroxysms administered to this group varied from five to sixteen and averaged ten. Temperatures varied from 103 to 106, the average as in other groups being 104 or 105 F. Icterus developed in two patients; two became somewhat anemic; three aborted the malaria; one developed an acute cardiac dilatation and was stopped, and one patient, a juvenile, became incontinent.

Lumbar puncture immediately following malarial therapy was done in twenty-eight patients. The serologic reaction remained the same in nineteen cases; three positives became negative, two became doubtful; there was lessened positivity in two cases. In two of the early secondary cases there was an increase in positivity. Most marked changes were noted in the cell counts, which varied from 0 to 40, other high counts being 37, 20, 11 and 10. The remainder were normal. The colloidal gold reaction showed less intensity in two first zone curves and in six second zone curves. It showed more in three of the latter. It reversed from second to first zone in two cases. The remaining gold curves showed no essential change.

In the case of the eight unusually early patients with secondary syphilis, signs and symptoms disappeared entirely, including the florid secondary infections, which in most cases disappeared during the course of treatment. Epileptic seizures disappeared in all cases, but one of these three patients took on a definite aspect of dementia paralytica. Ten others showed well defined improvement. The severe headaches associated with meningeal irritation in all cases disappeared. The man with severe ulnar neuritis improved. No observation was made on the remaining patients.

### LATER OBSERVATIONS

To the foregoing observations we have been able to add, in most cases, clinical and serologic data obtained at periods varying from three months to three years. Note has been made of the fact that patients did not all return as requested or were not able to do so. The following considerations and comparisons are therefore based on last interviews with the patients.

*Tabetic Group.*—Of this group of nineteen, two have not returned for check-up examinations and no information is available. A report on two others states that they have improved, in one case to a marked degree, but the serologic data could not be obtained.

Five patients were seen from eighteen to thirty months after malarial therapy. One of these seemed unimproved. The remainder were doing exceedingly well; working, gaining weight and, in some cases, practically asymptomatic. One had had two attacks of gastric crises; in one a normal pupillary reaction had become Argyll Robertson; in another, who had shown irregularities, the ocular condition became normal. One could not remain for lumbar puncture; another was reported by his home physician and observations on the fluid were not available. Of the positive reactions found in the remaining three, two continued to be positive and the other became negative. The colloidal gold test was normal in one, became normal in the second, and reversed from second to third zone in the third. One four plus blood test became negative.

Four patients were seen at the end of a year. One of these was definitely worse, particularly in regard to gastric crises; in fact, a sympathectomy was resorted to in an effort to control these. The other three patients had improved remarkably. The first showed no serologic changes. A second showed no change in the spinal fluid; one changed from three plus to one plus; one from plus-minus to three plus. One gold curve did not change; two others became normal. One two plus blood test became negative.

Six months after malarial therapy, four patients were last seen and of these, one who had shown improvement immediately following therapy had become definitely worse. The other three showed marked improvement as to general well being; they gained weight, were stronger, less ataxic and had fewer if any pains. In one, no serologic information was obtainable; in none was the spinal fluid serology changed. One showed a change in the gold curve from first zone to second; one showed a change from second to first, and the third changed from a second zone curve to normal.

Two patients were not again heard from after a third month check-up. Both of these had gained weight but were otherwise clinically unimproved. Both, curiously enough, showed a reduction to normal of their spinal fluids, including in each case a definite first zone type of curve. The blood test changed from three plus to negative in one and had been already negative in the other.

In none of the foregoing cases had there been much change in the cells and solids from the time of exami-

nation immediately following malarial therapy. If anything, there was a tendency to reduction of these.

Two of the group were not heard from; one had become worse, and eleven showed definite improvement, amounting at times to a symptomatic remission. The reaction of the blood became negative in several cases, and there were changes and reversals in the spinal fluid serologic tests which did not as a rule correspond to clinical observations. Gain in weight was an almost constant finding even in those who did not otherwise improve; diminution of lightning pains was a striking feature, and improvement of ataxia and of incontinence was many times observed. Comparing immediate and later results, it was found that ten showed improvement immediately following treatment; eleven showed later improvement, and one of the original ten relapsed.

*Group with Dementia Paralytica with Tabes.*—Of this group of forty-five, fourteen did not return. One of these died in an institution for the insane, while another died of an undetermined cause—deaths certainly not directly attributable to the malarial course.

Eighteen patients were seen from eighteen months to three years after malarial therapy. Of these, five were asymptomatic. Six were definitely improved, but optic atrophy in one and ataxia in two were not improved. Another had occasional attacks of gastric crises, and the sixth was still somewhat euphoric. Three more cases were considered arrested. Three patients became definitely worse, and in two of these dementia paralytica became much more marked. In five cases the reaction of the blood changed from positive to negative; in two the blood serologic reactions became less positive. In eight cases the serologic reactions remained the same: six positive, two negative. The Kahn or Wassermann reaction of the spinal fluid changed from positive to negative in five cases, became less positive in two, remained positive in ten, and in one case no serologic information was available. The colloidal gold test remained the same in six cases; that is, three remained second zone, of which one showed higher figures, the dementia paralytica becoming more pronounced, while three first zone curves did not change appreciably. There was a reversal of curves in eight instances: first zone curves became second zone. The first zone and one second zone curves became normal. There was a vacillation in one case: a first zone curve changed several times, becoming finally second zone.

Five patients returned after six months. All were definitely improved, and four of them were working. Two complained still of poor memory; one showed only slight improvement and one showed marked symptomatic improvement. None of the group were worse, and none had become asymptomatic. Blood tests were not done in three instances, one remained the same, another positive test had become negative. The Kahn or Wassermann reaction of the spinal fluid remained the same in these two cases, and in these the colloidal gold test did not change.

Good results were obtained in the group which was last seen three months after the malarial treatment. Three of these cases were entirely asymptomatic; in two the condition was definitely improved; one was arrested, and in one the condition was definitely worse, there being a Charcot joint. There was in all cases a weight gain. In the five cases reported, the blood serologic reactions remained the same, four being positive and one negative. Spinal fluid examinations were done in three of these cases, remaining positive as before. The colloidal gold curves remained the same in two cases; one was first, the other second zone, and it reversed from first to second zone in the third.

Reduction or increase in solids and cells paralleled each other for all groups. They were decreased in thirteen cases, markedly less in seven, unchanged in eight, and increased in two.

Fourteen of the group were not directly heard from. Death occurred in two of these. Eight cases were considered to be asymptomatic, thirteen were improved, four arrested, and four were definitely worse. A weight gain was noted in practically all cases. Positive blood tests became negative in five cases; three showed less positivity, eleven remained positive, and three remained negative. Spinal fluid tests changed from positive to negative in seven patients, became less positive in two, and remained positive in thirteen. The colloidal gold reaction became or remained the same in twelve cases, changed from first to second zone in fourteen cases, and became normal in the remainder. Comparing immediate and late results, it is to be observed that two patients had died, the exact cause being unknown; one of them presumably had dementia paralytica. Twenty-one showed definite improvement as to symptoms, in comparison to fourteen in whom improvement was noted immediately following therapy. Four cases appeared to be in a state of arrest. Four were definitely worse. It is to be pointed out at this time that, while there is an increase in the number which showed improvement or arrest, it is to be supposed that the group which did not return for reexamination numbered among them many who had become worse. It is encouraging to note that an increasingly large number of improvements is to be observed in proportion to the time elapsing between malarial therapy and reexamination.

*Syphilis of the Central Nervous System (Diffuse Type).*—Of this group of thirty-two patients, twenty-eight returned for examination. This includes the group of early cases, which are of particular interest and which will now receive especial consideration. At the end of one year, six of this group were entirely asymptomatic. One patient who had received no antisyphilitic therapy, except the malarial treatment, returned with mucous patches at the angles of the mouth, from which *Spirochaeta pallida* was readily demonstrated. It is of unusual interest to note that she had no central nervous system signs or symptoms and that the spinal fluid examination was entirely negative. For the patient with unusually severe meningitis and marked secondary syphilis, careful treatment had been prescribed. He did not follow this treatment and, as a result, was seen at another clinic with nodulo-ulcerative lesions and more marked signs and symptoms of central nervous system involvement. The two neurorecurrent cases presenting severe meningeal symptoms had become entirely asymptomatic, as previously mentioned.

The serologic reactions of the blood showed interesting changes. In three patients, positive reactions became negative, and two blood tests showed less positivity, while three reactions remained positive. The spinal fluid reactions showed a greater change: five positive reactions became negative, one became less positive, and two remained positive. Four first zone curves and one second zone curve became normal. One first zone curve did not change. A second zone curve, after becoming first zone in type, returned to the second zone type. One first zone curve and one normal curve

did not change. Cells and solids became normal in all cases.

Of the remaining patients in this group, seven returned for check-up examination at the end of two years or more. Four of the cases had become asymptomatic; one patient showed improvement but complained of headache at times; one patient complained of slight incontinence; another case was asymptomatic but had signs. Serologic information was not forthcoming in two of the group. The serologic response of the blood remained positive in three. Two positive reactions became negative. In the case of the spinal fluids, two reactions remained positive and three became negative. Two fairly normal gold curves and a second zone curve remained unchanged. Two second zone curves became normal.

Four patients were seen at the end of a year. In one, a congenital case, the signs and symptoms of cerebrospinal involvement had disappeared, together with improvement of an interstitial keratitis. The patient with hemiplegia falls in this group. While improved generally, he showed no improvement of the hemiplegia. The man with ulnar neuritis (possibly not syphilitic) showed improvement of this symptom immediately following treatment, but at the end of a year became much worse, and his condition suggested dementia paralytica. The fourth was much improved. The blood reactions in this group remained positive in two and became less positive in two. The serologic reaction of the spinal fluid remained positive in two patients, became negative in one, and became more positive in the patient with ulnar neuritis. The colloidal gold reaction remained the same in two cases, became normal in one, and reversed from first to second zone in the fourth.

At the end of six months, four patients were seen: two had become entirely asymptomatic, one showed an improvement, complaining of numbness and leg pains, and a fourth felt much better but was weak. Serologic tests on the blood remained the same in two patients: one positive, the other negative. One positive test became normal, another less positive. On the other hand the spinal fluid tests became negative in two cases and remained equally positive in two. Of three first zone curves, two remained the same while one showed less intensity. A second zone curve became normal.

Seven patients were last seen at the end of three months. Three cases were asymptomatic; one showed marked improvement; one epileptic patient was markedly improved but had an occasional attack; one, who was otherwise normal, complained of pain in the precordium, the reason for which was not discoverable, and one case was asymptomatic without change in signs. In other words, all in this group improved. Information regarding the serologic changes of the blood was unobtainable in four cases, and three remained the same, two positive, one negative. Spinal fluids were examined in all cases, remaining positive in four cases, becoming negative in one, and less positive in two. Two essentially normal gold curves remained so; changes were noted in the rest. Three second zone type curves became normal, a first zone curve less intense, and a first zone curve became second zone.

In the entire group, solids and cell counts for the most past paralleled one another. All high cell counts were markedly lowered. Nine remained the same; none of these were high; four of them had been normal originally. Three showed slight increase in cells and solids. Five showed a decrease, whereas in eight patients a marked decrease in cells and solids was to be observed.

Of the eight early cases in this group, six remained entirely negative; one showed recurrent mucous patches, without cerebrospinal symptoms—a most interesting observation—and the other, owing to lack of further treatment, showed neurorecurrence accompanied by lesions of the tertiary type. Epileptic seizures, which had immediately disappeared in three cases, returned in one but were less prominent and frequent, general improvement being evident. Nine cases became entirely asymptomatic; seven showed improvement of varying degrees; in one case headache persisted, in others, slight incontinence of urine, backache, and pain in the precordium, and in a patient with hereditary syphillis all symptoms of cerebrospinal origin improved, together with improvement of interstitial keratitis. In two, signs persisted but symptoms had disappeared; one only was unimproved and one made definitely worse. Gain in weight was again noted. Presumably, of those who were not reexamined some became worse. This group shows the most favorable results, as might well be expected, for the involvement was not as severe as that in the two preceding groups. It is of interest that many serologic tests of the blood and even more spinal fluid tests became negative; that in this case increased involvement was matched by increased serologic responses, and that once more there was no relationship between clinical results and the colloidal gold determinations. Once more, cells and solids showed marked reduction.

## CONCLUSIONS

1. Malarial therapy was used in the treatment of tabes, of dementia paralytica with tabes, and of diffuse neurosyphilis, including cases complicating the secondary stage.

2. In a large percentage of cases, immediate improvement was noted. Thus, 53 per cent of the tabetic group showed immediate improvement, and later observation increased this group to 67 per cent. In the greater number of these, improvement amounted to complete symptomatic remission. One patient showing immediate improvement relapsed later.

3. In patients with dementia paralytica with tabes, 40 per cent showed immediate symptomatic improvement; later observation increased this figure to 67 per cent. Thirteen per cent of the cases were arrested; 13 per cent were made worse, and 7 per cent of the patients died after leaving the hospital.

4. The immediate results were most striking in the diffuse central nervous system group. In the group complicating secondary syphilis, all eight were immediately improved; seven later remained asymptomatic, and one subsequently relapsed. In this case, recommended therapy was not carried out.

5. Twenty-four cases of later occurring diffuse neurosyphilis showed striking immediate improvement in all but one case. The later follow up of this group showed improvement in 84 per cent, no change in 10 per cent, and a change for the worse in 6 per cent.

6. Ultimate gain in weight was an almost uniform feature, even in patients who did not otherwise improve.

7. Following treatment, many colloidal gold curves became negative, reversed, or became more or less intense without paralleling clinical results.

8. Reversal of the serologic reaction or diminution of its positivity occurred more often in the spinal fluid than in the blood in the group studied.

9. Decrease in cell counts and organic solids was almost invariably noted.

10. From the foregoing conclusions, it is apparent that malarial treatment is a definitely beneficial addition to the armamentarium of neurosyphilitic therapy.

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## TREATMENT BY MALARIA IN ASYMPTOMATIC NEUROSYPHILIS *

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In September, 1928, I [1] emphasized the fact, previously noted by Wagner von Jauregg,[2] that, although treatment by malaria is the most effective form of treatment for patients suffering from dementia paralytica, the ideal time to apply the treatment is before the paresis develops. I suggested then that the patient with paresis sine paresi is the ideal candidate for such treatment. Paresis sine paresi includes that phase of neurosyphilis which is sometimes designated as impending paresis, a status in the course of the disease when the clinical signs suggest parenchymatous involvement of the nervous system but are not conclusive enough to warrant such a diagnosis. However, the reactions of the spinal fluid in paresis sine paresi, because of resistance to treatment and the fact that the disease has maintained the paretic characteristics for a long time, permit such cases to be classified distinctly although temporarily. Obviously, it is a transient phase in the neurosyphilitic process in which treatment does not always stay the development of the clinical paresis.

Asymptomatic neurosyphilis, on the other hand, is a phase of neurosyphilis that is manifested only by positive reactions of the spinal fluid. The patients do not present clinical signs of involvement of the nervous system. Asymptomatic neurosyphilis is frequently a manifestation of acute syphilis and the basis for the development of parenchymatous neurosyphilis many years later. It is because of the existence of this early and often asymptomatic involvement of the central nervous system that examination of the spinal fluid is a paramount feature in the care of patients with syphilis.

I report at this time the results of treatment by malaria in a group of cases of asymptomatic neurosyphilis. The basis for the report is a series of fifty-eight patients, eighteen of whom were women and forty of whom were men. The first of these patients was inoculated with *Plasmodium vivax* in October, 1924, and the last inoculation was made in February, 1930; the observation periods following treatment, therefore, extend from one to six and a half years. In the group are included a few cases in which the neurosyphilis was recognized during the secondary manifestations of the disease but in which four courses of arsphenamine in conjunction with intensive treatment by mercury, bismuth and iodide did not materially improve the condition of the spinal fluid. In a second group, treatment was started while the patient was in the so-called latent or quiescent period of the disease, within the first five years of the infection, and examination of the spinal fluid revealed that the fluid was resistant to the usual treatment; the third and largest group includes patients in whom syphilis has been known to exist for periods varying from six to twenty-three years, who have received much intravenous and intramuscular treatment, and whose spinal fluid remained positive or reverted to positive when the patient was placed under observation without treatment. It is again emphasized that none of these patients presented sufficient objective signs of involvement of the nervous system to warrant a clinical diagnosis of neurosyphilis.

Moore and Hopkins [3] estimated the incidence of asymptomatic neurosyphilis as 26.4 per cent and reported that, in slightly more than half of their cases in which treatment was given, clinical and serologic response was favorable while, in a decidedly smaller number, parenchymatous neurosyphilis developed. They expressed the belief that the character of the spinal fluid is an index to the possibility of the eventual development of objective signs of neurosyphilis. I have not attempted a classification such as that suggested by Moore and Hopkins, because in my group of cases the periods of observation following the treatment by malaria have not been long enough to permit of significant deductions as to the clinical progress of the disease. In my appraisal of treatment by malaria of asymptomatic neurosyphilis the deductions I made are based only on the serologic reversals and, if all the factors in the spinal fluid were completely changed to negative or to within normal limits, the results were interpreted as successfully treated.

In twenty of the fifty-eight cases the condition of the spinal fluid was completely reversed to normal following treatment by malaria. It is significant that in thirteen of these twenty cases between twenty-four and forty-six injections of arsphenamine of various types had been given with corresponding amounts of mercury and bismuth, before treatment by malaria was instituted; only in five of these twenty cases was antisyphilitic medication given following the course of malaria. In an additional eight cases, all the factors in the spinal fluid were reversed to negative except the Wassermann reaction (Kolmer modification), which remained positive in varying strengths.

One other point on the influence of antisyphilitic treatment before and after treatment by malaria was noted in a group of five cases of asmyptomatic neurosyphilis in which treatment for syphilis was not given previous to treatment by malaria. In two cases there was a complete reversal to normal, in two there was no serologic improvement, and in one case the condition of the fluid was made worse. It was noted throughout that treatment by malaria followed by antisyphilitic treatment did not have significant influence on the result of the course of malaria. In the thirty-eight cases in which treatment was unsuccessful, clinical neurosyphilis developed in six: in four cases of the cerebrospinal type, in one case of the tabetic type, and in one of the progressive muscular atrophy type. Death occurred in one case of coronary sclerosis eight months after the malaria, but in five cases, in which syphilitic aortitis was diagnosed before treatment by malaria was instituted, significant progress in the cardiac disease was not observed.

Of thirty cases in which serologic benefit was not derived from treatment by the course of malaria,

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* From the Section on Dermatology and Syphilology, the Mayo Clinic.
* Read before the Section on Dermatology and Syphilology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

1. O'Leary, P. A.: Treatment of Neurosyphilis by Malaria, J. A. M. A. 91: 543-545 (Aug. 25) 1928.
2. Wagner von Jauregg, Julius: Malariatherapie, Wien. med. Wchnschr. 78: 275-278 (Feb. 25) 1928.
3. Moore, J. E., and Hopkins, H. H.: Asymptomatic Neurosyphilis: VI. The Prognosis of Early and Late Asymptomatic Neurosyphilis, J. A. M. A. 95: 1637-1641 (Nov. 29) 1930.

pleocytosis was increased or the Wassermann reaction became more strongly positive in fifteen. In sixteen cases in which there was a reversal of the spinal fluid to normal, however, there was a relapse to the original status while the patients were under continued observation. Of the forty cases in which the Wassermann reaction of the blood was positive at the time of the inoculation with *Plasmodium vivax*, in fifteen there was reversal to normal, which has remained.

The duration of the syphilitic infection was not a factor in estimating the outcome of the treatment by malaria. The duration of the syphilis, in the cases in which treatment was successful, ranged from eighteen months to twenty-three years, with an average incidence of ten years and five months. Similarly the duration of the neurosyphilis was not of prognostic significance, nor did the type of the colloidal benzoin reaction aid in forecasting the result of the treatment. The cases with a first zone or paretic type of curve had practically the same incidence of reversal as did those with the second zone or so-called syphilitic type of curve. A similar appraisal was made of the cell count in the spinal fluid. With reference to pleocytosis the cases were divided into three groups: (1) those with lymphocytes up to 50 in each cubic millimeter; (2) those with from 51 to 100, and (3) those in which there were more than 100. In fifteen of the cases of the first group, in four of the second group, and in one case of the third group, treatment was successful. Of the eight cases in which the condition of the spinal fluid was improved, five were in the first group, one case was in the second group and two cases were in the third group. In most of the cases, intensive treatment had been given before the course of malaria, which resulted in a higher incidence of low cell counts; significant deductions from a study of this feature of the characteristics of the spinal fluid, therefore, are not justifiable.

### COMMENT

In these fifty-eight cases there were no outstanding features in the history, in the characteristics of the spinal fluid or in the influence of the arsphenamine previous to the course of malaria that could be used as significant guides in selection of the type of asymptomatic neurosyphilis that will derive the most benefit from treatment by malaria. The incidence of serologic reversal in this group is lower than in cases of paresis sine paresi (45 per cent).[4] Early in my experience with this treatment I purposely avoided the use of antisyphilitic medication following the course of malaria, with the idea of not confusing the results. However, I now urge all patients treated in this manner to receive either arsphenamine or bismuth, or both, within six months after the course of malaria, because observation has shown that, although the progress of the neurosyphilis may be arrested, other manifestations of syphilis in the viscera may become aggravated. Particularly significant is the fact that 34 per cent of a group of patients with asymptomatic neurosyphilis, the majority of whom had undergone intensive treatment with arsphenamine, tryparsamide, intraspinal medication, mercury intramuscularly, bismuth, and large doses of potassium iodide, had experienced complete reversal of the spinal fluid to normal following treatment by malaria. Likewise, antisyphilitic treatment following the malaria did not materially help in producing these reversals. In an additional 14 per cent the spinal fluid was greatly improved. In none of the cases in which treatment was successful have objective neurologic signs of the disease as yet appeared. Continued examinations in these cases will be necessary to prove this observation. In addition to its accomplishments in the treatment of dementia paralytica, it is evident from this study that treatment by malaria has the additional value of being the outstanding agent for the prevention of parenchymatous neurosyphilis after a trial with the usual measures of treatment has failed.

4. O'Leary, P. A., and Brunsting, L. A.: The Nonspecific Treatment of Neurosyphilis, J. A. M. A. **94**: 452-454 (Feb. 15) 1930.

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## ABSTRACT OF DISCUSSION

### ON PAPERS OF DRS. WILE AND DAVENPORT AND DR. O'LEARY

DR. JOSEPH E. MOORE, Baltimore: I agree with Dr. O'Leary that in most cases of asymptomatic neurosyphilis one should follow a system of preliminary treatment for six months or a year before instituting malaria therapy. Treatment with malaria is risky in any except expert hands. The only instances of asymptomatic neurosyphilis in which I adopt fever therapy from the outset are those patients with the dementia paralytica formula in the spinal fluid, who are, I believe, candidates for parenchymatous neurosyphilis in later life. The paper of Drs. Wile and Davenport is especially interesting in that they report a higher percentage of improvement from malaria therapy in tabes and meningovascular neurosyphilis than has previously been reported from this method of treatment by other observers on the continent, or than can be obtained by any other method of antisyphilitic treatment. My own experience with the malaria treatment of tabes has differed in two particulars, regarding which I should like to ask for further information. The symptom of ataxia, so far from being improved by malaria, has usually been made worse by it. I have come to fear also the fever treatment of tabetic patients with cord bladders and infected urine. Two deaths have occurred in such patients from ascending urinary infection during or shortly after the malaria. Finally, I would emphasize the fact that a perusal of the literature as to the results obtained in syphilis of the central nervous system by various methods of fever therapy, including malaria, relapsing fever, rat-bite fever, foreign protein and diathermy, seem to indicate that, while any of these methods is successful in dementia paralytica in a fair proportion of cases, the percentage of remissions obtained with malaria is definitely higher than with other methods of inducing fever. There appear to be fewer relapses and the remissions last longer. This, together with other facts that have developed in recent years, makes it seem to me probable that fever is not the only feature of the beneficial effect of this form of treatment, and that some other factor enters into the results. This other factor, whatever it may be, is more adequately provided by malaria than by other forms of induced fever. I feel that for the present the induction of fever by diathermy should be regarded as distinctly in the experimental stage.

DR. HAROLD N. COLE, Cleveland: All syphilologists have cases of resistant syphilis of the central nervous system. In the past it has been difficult to handle these cases, and the results have been poor, to say the least. I think from these statistics, from those of other clinics, and from my own statistics that we must not say we have another remedy at hand which gives us a great deal more hope in taking care of these resistant cases that do not seem to respond to anything else. We are using malaria more and more in all these cases, not necessarily dementia paralytica or its tabetic form, but in all cases of resistant syphilis of the central nervous system. I agree with Dr. O'Leary and Dr. Moore that we should use other treatment first, but if the patient does not respond in six months or a year he certainly should have malarial therapy. Treatment should be continued for some time afterward. We can then hope to make these patients asymptomatic.

DR. PAUL A. O'LEARY, Rochester, Minn.: In this appraisal I endeavored to evaluate malaria therapy only in the treatment of asymptomatic neurosyphilis, although recognizing that the use of the arsphenamines and compounds of mercury and bismuth is essential to the treatment. We must continue to emphasize the fact that the nonspecific methods of treating syphilis are not panaceas. They are, however, invaluable adjuncts to

the various specific measures, and are indicated when a trial with the "specifics" fails to produce satisfactory clinical and serologic results. With this point in mind we must accept cautiously the various preparations that manufacturers are offering for the treatment of syphilis, or at least wait until sufficient observation periods have elapsed until the value of these remedies is proved. In answer to Dr. Moore's question, up to 1926 we treated nine patients with optic atrophy. We stopped at that time because in several cases the atrophy became definitely progressive during the malaria course. We have since reexamined seven of these patients and in four of them the progress of the optic atrophy has apparently been arrested.

DR. UDO J. WILE, Ann Arbor, Mich.: My experiences, or those of my clinic, which were presented before this section some years ago, with the malarial treatment of dementia paralytica, were singularly at variance with those of other clinics. Our first 100 cases were disappointing. I am inclined to think that this was due to the fact that we purposely picked out advanced cases in which there could be no question of the clinical diagnosis of dementia paralytica. I expressed the opinion at that time and still believe that many cases treated as dementia paralytica with malaria and showing startling improvement or clinical cure are those in which a diagnosis is based on spinal fluid changes. Whether these cases are actually dementia paralytica or not is, I think, open to question, since the diagnosis based on spinal fluid changes alone would certainly include some cases of cerebral edema and basilar meningitis and possibly psychoses occurring with cerebrospinal syphilis of the vascular type. In the results of the almost 100 cases presented today, as Dr. Cole has brought out, we have found in malaria a useful therapeutic procedure in arresting other forms of cerebrospinal syphilis than dementia paralytica. With regard to the question Dr. Moore brought up relative to the ataxia, I may say that we have noted definite improvement in some of the cases. This improvement I think must be dependent not on the organic change but on the invariable accompanying functional disability which these patients have. A considerable part of the tabetic patient's ataxia, like his impotence, is functional. As the patients improve in weight and strength they overcome a functional disability and in some of our cases patients previously using a cane were able to walk without one and with distinctly less ataxia. We have had the same experience Dr. Moore has had with reference to the cord bladder, and we are now not giving malarial therapy to any patients with bladder disturbance. With regard to optic atrophy, we have had no experience with this because the group is too small. I have the same impression that Dr. O'Leary expressed, for in one proved case the patient has not developed any further progress of this condition. We can add a small group of eight patients to those of Dr. O'Leary in the prophylactic group. In that group the patients were entirely free of the spinal fluid changes at the end of treatment, but one has relapsed. It seems there may be some advantage in giving a short course of malarial therapy in the early periods. I do not agree that it is always wise to treat patients with tryparsamide and other remedies first. If malaria will do what we expect it to do we should not wait a year before giving patients the benefit, as long as they can be hospitalized and protected properly.

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**Medicine and Science.**—Those of us who in modern times have come into contact with the study of disease when this has been in the hands of chemists and physicists have become amply aware of the fact that the peculiar nature of disease phenomena themselves interferes with an appreciation of them on the part of individuals who are not primarily trained in their contemplation. No doubt the solution of problems of first importance in relation to disease may originate in disciplines outside of medicine, as in the case, for instance, of Pasteur; and in the future, likewise, important contributions may be expected to arise in this manner. For the boundaries between the sciences are artificial. I am here concerned with the development of medical science, not through chance, but by organization. If there is a satisfactory case to be made for the science of medicine, it surely must suggest as a consequence the value of affording to its own votaries the opportunity for investigation.—Cohn, A. E.: Medicine, Science and Art, Chicago, University of Chicago Press, 1931.

# A STUDY OF THE ETIOLOGY OF MULTIPLE SCLEROSIS *

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CHICAGO

The different theories dealing with the origin of multiple sclerosis may be divided into five groups according to the etiologic agent that is thought to be responsible for the disease: spirochetes, filtrable virus, myelolytic ferments, endotoxins or primary disease of the glia. Elsewhere [1] a short review of the literature has been given; a more detailed criticism has been published by Brain.[2] In the present study, experiments are described in which the attempt was made to demonstrate the presence of a filtrable virus in cultures from spinal fluids of patients with multiple sclerosis, as reported by Chevassut [3] and Purves-Stewart.[4] A discussion of the probable reasons for the negative results follows, together with a review of more recent experiments which speak against the infection theory of multiple sclerosis.

The English research in this disease has been influenced by the work of W. E. Bullock (now W. E. Gye [5]). Bullock injected spinal fluid from patients with multiple sclerosis into rabbits subcutaneously and obtained a paralysis of the hind limbs in four out of five animals within nineteen to twenty-two days. In wild rabbits, no effect was seen. Histologically, Marchi preparations showed black staining myelin sheaths in the periphery of the spinal cord sections, but the picture was not typical of multiple sclerosis in man. The conclusion was that most likely a filtrable virus was responsible for the lesions.

Chevassut and Purves-Stewart tried to prove the existence of a filtrable virus by taking cultures of cerebrospinal fluids from patients with multiple sclerosis. It is interesting to note that all their experiments in multiple sclerosis followed the same lead that had been followed by Gye [6] (formerly W. E. Bullock) and Barnard [7] when they carried out their research on the hypothetic virus producing malignant growths. Some of the more striking similarities may be cited: Gye found, after a large variety of mediums had been prepared, that Hartley's broth with fresh rabbit's serum added (5:1) was most favorable for the growth of the cancer virus. After many negative results, Miss Chevassut used a mixture of Hartley's broth with human serum (10:3). Gye found that, when dextrose, maltose or levulose was added to the cancer culture, the $p_H$ often rose as high as from 4.0 to 4.5. Miss Chevassut found that the $p_H$ of the cultures of cerebrospinal fluid of multiple sclerosis, after the addition of 1 per cent dextrose, changed the $p_H$ from 7.6 to 6.4 Barnard pointed out that it was not possible to prove the formation of colonies in fluid mediums, and

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* From the Institute of Neurology, Northwestern University Medical School.

* Read before the Section on Nervous and Mental Diseases at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

1. Weil, Arthur; and Cleveland, D. A.: A Serological Study in Multiple Sclerosis, Tr. Am. Neurol. A. 57, 1931.
2. Brain, W. R.: Disseminated Sclerosis, Quart. J. Med. 23: 343 (April) 1930.
3. Chevassut, Kathleen: The Etiology of Disseminated Sclerosis, Lancet 1: 552 (March 15) 1930.
4. Purves-Stewart, James: A Specific Vaccine Treatment in Disseminated Sclerosis, Lancet 1: 560 (March 15) 1930; Brit. M. J. 1: 950, 1930.
5. Bullock, W. E.: The Experimental Transmission of Disseminated Sclerosis into Rabbits, Lancet 1: 1185, 1913.
6. Gye, W. E.: The Etiology of Malignant New Growths, Lancet 2: 109 (July 18) 1925.
7. Barnard, J. E.: The Microscopical Examination of Filtrable Viruses, Lancet 2: 117 (July 18) 1925.

he adopted the agar slip method devised by Welch. Miss Chevassut used the same method for making cultures of the hypothetic multiple sclerosis virus. If one compares her photomicrographs of colonies or of single spheres with Barnard's pictures of virus colonies from Rous's fowl sarcoma, human cancer or mouse sarcoma (plate II, figs. 1, 2, 4, 7, Barnard [7]), one is deeply impressed by the striking similarity of the two

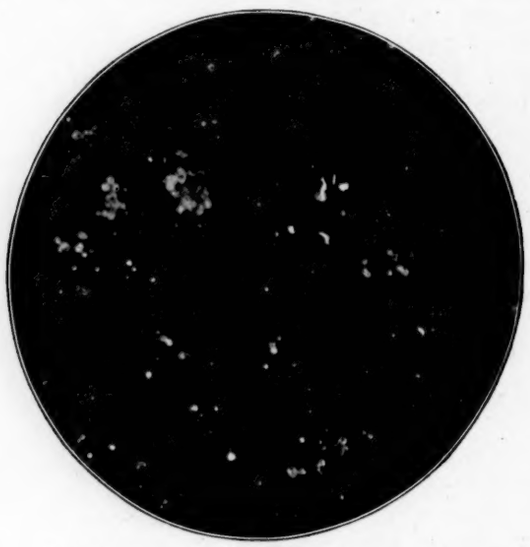

Fig. 1.—Forty-hour agar-serum-spinal fluid culture from case of multiple sclerosis. This and the accompanying photomicrographs were made with Beck's focusing dark ground illuminator, 2 mm. apochromatic oil immersion object glass, 1.2 normal aperture, and compensating eyepiece 25 ×. The extension of the camera was adapted to such a length that the linear magnification was 1,000 diameters measured with an ordinary condenser as illuminator.

sets of photomicrographs. Finally, the "life cycle" of the multiple sclerosis virus, as illustrated in Sir James Purves-Stewart's lantern slides, is a true companion piece to the diagrammatic representation of Barnard of bodies seen in cultures of bovine pleuropneumonia. In both, the small granules were shown attached to the larger spheroids, sometimes by a fine filament.

At the Westminster Hospital, through the kindness of Sir James Purves-Stewart and Miss Chevassut, I had the opportunity to become acquainted with the original method of preparing cultures from the spinal fluid in cases of multiple sclerosis. The optic outfit which they used, together with a mercury vapor lamp, was purchased from Beck and Son, and work was started in this laboratory at the end of 1930. The same technic was used as that described by Miss Chevassut. Under aseptic precautions, spinal fluid was taken from the patients at the hospital and immediately carried to the laboratory across the street. Two different cultures were prepared: The first one was a mixture of 2 per cent agar in Hartley's broth, which had been sterilized in the glass tubes together with three glass slips and their supporter. The agar was melted in the water bath, cooled to 45 C., and a mixture of 3 cc. of normal human serum, filtered through a Seitz filter, and 5 cc. of spinal fluid was added, after having been warmed to 40 C. The second culture was prepared by adding to 10 cc. of Hartley's broth a mixture of 3 cc. of serum and 8 cc. of spinal fluid. Both cultures were incubated at 37 C. for different lengths of time. From more than thirty cases of multiple sclerosis which had been studied, sixteen were selected for spinal fluid cultures. In eleven experiments a culture from normal spinal fluid was prepared as a control and in the rest of the cases a mixture of agar broth with serum alone.

The slips from the agar cultures were examined under the dark-field microscope and photomicrographs prepared with a specially constructed photographic apparatus. In every slip from the multiple sclerosis cultures the spheres could be seen that had been described and photographed by Miss Chevassut. Many of them showed a small granule attached, and many colonies could be seen. Figure 1 is a representative picture of a forty hour agar culture of the spinal fluid from a patient with multiple sclerosis, in whom the first signs of the disease had appeared four years previously. But a similar picture could be obtained if spinal fluid from a patient not suffering from multiple sclerosis or any neurologic disease was used. Figure 2 is from a forty hour culture of the spinal fluid of a patient with hyperthyroidism, and figure 3 is from a twenty-four hour culture from a case of pulmonary tuberculosis. In these two controls, too, spheres, granules and colonies could readily be detected, and it did not seem possible to state that there was any difference between the general appearance, size, brilliance or number of the different spheres.

It was not necessary even to incubate the cultures in order to obtain sphere formation. Immediately after the agar had been mixed with the serum and spinal fluid and the slips had cooled off, numerous spheres and colonies could be seen in the dark-field microscope. They did not seem to be as large and numerous, however, as those seen in the forty hour cultures. Figure 4 illustrates such a preparation from a mixture of agar-serum with spinal fluid from a case of multiple sclerosis. Similar "growth" was seen in mixtures with normal spinal fluids that were immediately examined and in cultures from multiple sclerosis spinal fluid that

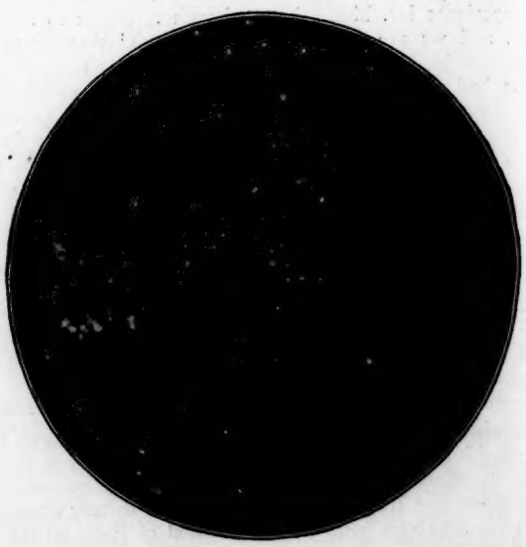

Fig. 2.—Forty-hour control, agar-serum and spinal fluid from a case of hyperthyroidism.

had been boiled for several minutes before it was mixed with the agar-serum. In agar or serum alone, only small isolated submicrons were detected, but mixtures of the two, with the addition of phosphate buffer of a $p_H$ of 7.6, produced the typical spheres and colony formation.

Some control spinal fluids that showed a positive Nonne reaction gave especially brilliant colony formation. It was suspected that the globulin content of the

spinal fluid might be responsible for this phenomenon. And, indeed, solutions of serum globulin prepared from human serum, when mixed with the agar-broth and when immediately examined under the dark-field microscope, showed the formation of spheres with granules attached and of colonies, which are pictured in figure 5. Emulsions of egg-lecithin mixed with the agar-broth produced similar pictures.

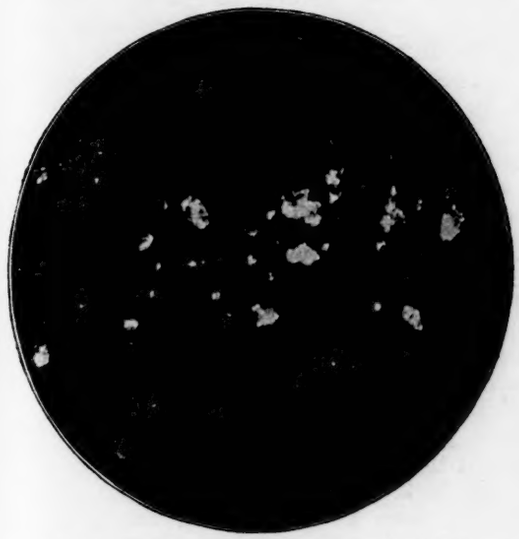

Fig. 3.—Twenty-four-hour control, agar-serum-spinal fluid from a case of pulmonary tuberculosis.

Much emphasis has been laid on the small granules which are attached to the spheres, sometimes connected with them through a fine filament. They had been thought to be a kind of spore, from which the spheres developed. The fact that the position of the granules could be changed at will with the change of position of the illuminating mirror suggested that one was dealing here with an optic reflection phenomenon. If the slips from agar cultures had become dry in the incubator, only small and isolated spheres could be detected but, on addition of a drop of 0.85 per cent sodium chloride solution or Hartley's broth, the usual dark-field picture was seen. This, perhaps, explains the fact (personal communication of Miss Chevassut) that the growth of the spheres is favored when the tubes containing the agar slips are kept in a moist chamber.

As to the size of the spheres, one may judge, from the optical outfit which was used and from Barnard's remark that the spheres which he photographed in his work on cancer were enlarged 1,850 times, that the spheres which were photographed by Miss Chevassut had an approximate size of 0.5 micron compared with 1.1 microns of Barnard's isolated spheroid from a Rous fowl sarcoma, or spheres from 0.5 to 1.5 microns which I found in normal controls. It is difficult to conceive how Sir James Purves-Stewart could detect spheres and differentiate them from other colloidal submicrons if they had the size of one ten-thousandth of a red blood cell = 0.00075 micron. As to the counting of the "granules," the small particles which are attached to the "spheres" and which may be isolated by ultrafiltration, such an undertaking seems impossible for the average human eye. An attempt to count the innumerable small granules in a broth culture of spinal fluid is difficult on account of constant rapid brownian movement of the particles.

One is not surprised about such phenomena if one is familiar with the fundamental theories of colloidal chemistry.[8] The influence of temperature on the average size of colloidal particles, which increases proportionally to the temperature, the aggregating action of inorganic salt solutions (Hartley's broth), the diminution in surface tension of serum during its preservation, and the dilution of the serum proteins by addition of the spinal fluid all act as aggregators; i. e., these different factors tend to increase the size of the colloidal particles.

Recent observations of Carmichael[9] contradict the statements of Miss Chevassut as to the acid formation in dextrose-broth-serum cultures and the abnormalities found in the levulose tolerance tests in patients with multiple sclerosis. He also found, under the guidance of Barnard, that there was no difference in the dark field of multiple sclerosis agar slips and those from normal controls. Not much encouragement to continue research along this line can be gained from such experiences.

A small minority of research workers follow the original idea of Marburg.[10] He thought that a lipolytic ferment might be responsible for the destruction of the myelin sheaths in multiple sclerosis. Recently, Brickner[11] took up again this research lead. He showed that plasma from patients with multiple sclerosis has a demyelinating action on the spinal cord of the rat, but the difference from normal serums was only quantitative. Among the normal serums, he found 18 per cent which acted like the most active multiple sclerosis serums, Cleveland and I found such a difference in the action of multiple sclerosis serums, but the demyelination did not go parallel to the amount of lipase present and, finally, pancreas lipase did not show any effect on rats' spinal cords. Brickner demonstrated in his second communication that the acid formation after addition of a lecithin emulsion to multiple sclerosis serums is

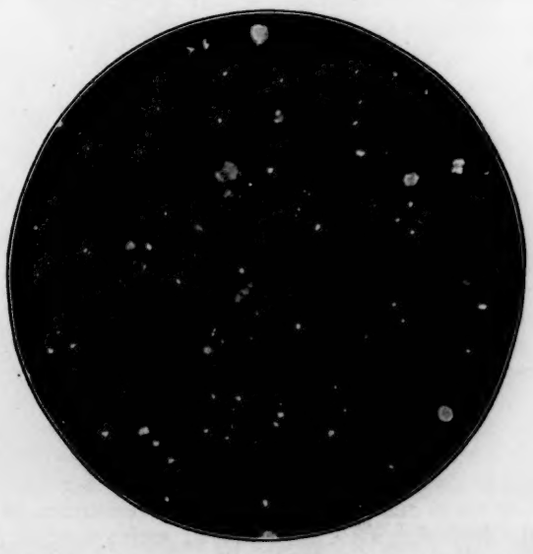

Fig. 4.—Agar-serum-spinal fluid from multiple sclerosis, photographed immediately after the spinal fluid was mixed with the agar-serum.

greater than in normal serums. He concluded that an abnormal lipolytic ferment must be present. But his statement that the action of this ferment is suppressed

8. von Weimarn, P. P.: Theory of the Colloidal State of Matter, in Alexander, J.: Colloid Chemistry, New York **1**: 27, 1926.
9. Carmichael, E. A.: The Etiology of Disseminated Sclerosis, Proc. Roy. Soc. Med. **24**: 591, 1931.
10. Marburg, Otto: Multiple Sklerose, in Lewandowsky: Handbuch der Neurologie, Berlin **2**: 911, 1911.
11. Brickner, R. M.: Studies of the Pathogenesis of Multiple Sclerosis, Arch. Neurol. & Psychiat. **23**: 715 (April) 1930; Bull. Neurol. Inst., New York **1**: 105 (Jan.) 1931.

by the addition of sodium oxalate while, on the other hand, such oxalated plasma has a demyelinating effect on rats' spinal cords, speaks against the action of a lipolytic ferment. I have pointed out in former publications [12] that demyelination of nerve fibers can easily be produced in test tube experiments by many toxins which, at the same time, are hemolytic and, among others, also by a bile product, sodium taurocholate. It was suggested that the same mechanism might be responsible for the dissolution of the hypothetic lipoid membrane of the red blood cells and the lipid membrane of the myelin sheaths. Therefore, no absolute evidence is yet presented that a ferment must be responsible for the demyelination found histologically in multiple sclerosis.

Marburg left open the possibility that unknown toxins, as assumed by the fourth group of research workers, might be the etiologic agent. He cited the different substances that had been thought responsible, referring especially to the lead theory of Oppenheim and to the ideas that metabolic products such as indole, skatole and phenol, might be responsible factors.

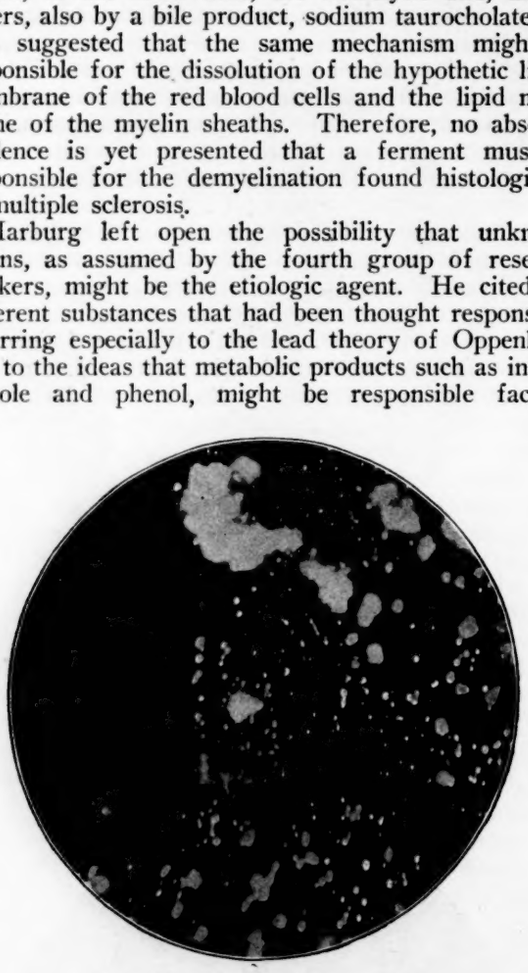

Fig. 5.—Serum globulin in agar-broth.

Hassin [13] supported the theory of the action of a toxin acting on the myelin sheaths, based on histologic evidence. Putnam [14] demonstrated two dogs, which showed multiple sclerosis-like lesions in the spinal cord following injection of tetanus toxin, and he reviewed former sporadic reports of a similar nature.

Assuming the presence of a toxin circulating in the blood, there must be another factor present which allows these toxins to penetrate through the hematoencephalic barrier and invade the central nervous system, or there must be a diminished resistance of the myelin sheaths against the action of such a toxin. Such conditions may be established in trauma, infection and pregnancy—all of them conditions known to favor the onset of multiple sclerosis.

An attempt was made to demonstrate the presence of a myelolytic toxin in the urine of patients with multiple sclerosis and the following interesting observations were made: Fifty cc. of urine was evaporated in vacuo at from 50 to 60 C. and the remainder was redissolved in 5 cc. of a buffer solution of a $p_H$ of 7.6, prepared from a mixture of primary and secondary phosphates. This solution was incubated with a small piece of rat spinal cord (approximately 5 mm. in length) for twenty-four hours at 37 C. The spinal cord was then fixed in a diluted "solution of formaldehyde-U. S. P." (1:10) and embedded in paraffin, and sections were stained for myelin sheaths with Weil's method. Under the microscope, with oil immersion, a peculiar destruction of the myelin sheaths was seen in twelve out of fourteen preparations from the urines in cases diagnosed as multiple sclerosis. The myelin sheaths were broken up into numerous fine granules, which were arranged along the original outlines of the sheaths. In a section stained by Davenport's method the axis cylinders appeared markedly swollen but did not show such a marked fragmentation as the myelin sheaths. Eighteen out of twenty urines from normal persons and dispensary patients, which did not show neurologic disease, did not produce this picture of globular fragmentation of the myelin sheaths of rats' spinal cords. The myelin sheaths had preserved their original outlines but were more or less swollen. In a case of Friedreich's disease, which was studied at the Montefiore Hospital in New York, the same histologic picture was seen in rat spinal cord, which had been incubated with the urine of this patient, as that described in multiple sclerosis. In a case of postencephalitic parkinsonism the fragmentation was vaguely present in some places, while the rest of the sections appeared normal. The urine of a patient with facial neuritis did not produce any change in the rat spinal cord.

Preliminary control experiments showed that urea or phenol is not responsible for the phenomenon described. The experiments are continued with the idea of trying to determine the factor responsible for the myelin fragmentation in most of the specimens of urine from cases of multiple sclerosis and those which might be found in controls.

In recent years, many instances have been reported in which demyelination of the spinal cord had been produced experimentally in animals fed with a diet deficient in certain vitamins,[15] and this demyelination also had been found in rats to be connected with glial overgrowth.[16] It was recently reported [1] that the inorganic phosphorus content of the serum of patients with multiple sclerosis is, in more than one third of all the cases, far below the figures that were found in the average of normal persons and of patients suffering from other diseases.

The theory of Mueller and Struempell,[17] that in multiple sclerosis one is dealing with a primary disease of the glia, which, by its overgrowth, compresses and destroys the myelin sheaths, has never found many supporters. The fact that demyelination precedes the glial reaction speaks against such a mechanical hypothesis. But there still remains the possibility that damage or disease of the glia may interfere with the rebuilding of the ever changing lipid material of the myelin sheaths, if one accepts Del Rio Hortega's theory that the oligodendroglia is responsible for the metabolic regulation of this structure. In this connection, it

12. Weil, Arthur: The Effect of Hemolytic Toxins on Nervous Tissue, Arch. Path. **9**: 828 (April) 1930; Die Wirkung von Schlangengiften auf Nervengewebe, Arch. f. exper. Path. u. Pharmakol. **154**: 228-238, 1930.
13. Hassin, B. G.: Pathology of Multiple Sclerosis, Tr. A. Research in Nerv. and Ment. Dis. **2**: 144, 1921.
14. Putnam, Tracy: Acute Multiple Sclerosis in Dogs, Arch. Neurol. & Psychiat. **24**: 640 (Sept.) 1930.
15. Gildea, E. F.; Kattwinkel, E. E., and Castle, W. B.: Experimental Combined System Disease, New England J. Med. **202**: 523 (March 13) 1930.
16. de Aberle, S. G.; Zimmerman, H. M., and Brill, L.: Paralysis in Rats on a Vitamin-A-Low Diet, Anat. Rec. **48**: (supp.) 7, 1931.
17. Mueller, E.: Multiple Sclerose, in von Bergmann, G., and Staehelin, Rudolph: Handbuch der inneren Medizin, ed. 2, **5**: 724, 1925.

should be mentioned that, in multiple sclerosis, mostly that portion of the cranial nerves is attacked in which glia is present, while the more distant parts, in which connective tissue replaces the glia, more frequently remain intact. Perhaps this may explain the frequent and early involvement of the optic nerve.

There still exists the possibility that, despite the apparent similarity of the histologic picture, different etiologic factors may be responsible for the production of different forms of multiple sclerosis. One might theorize on the probability that the difference in degenerative and inflammatory forms, which Spiller [18] has pointed out, is merely a difference in degree of action of one and the same etiologic factor. All such discussions will emphasize the fact that we are still far away from a definite solution of the problem.

### CONCLUSIONS

1. Repetition of the experiments of Chevassut and Purves-Stewart failed to produce convincing evidence that, in multiple sclerosis, cultures from spinal fluids yield a filtrable virus and that this virus is responsible for the production of the disease.

2. The fact that spheres and colonies of spheres may more readily be seen in agar cultures of spinal fluids that have given a positive globulin reaction suggests the precipitation of colloidal protein (or lipid) particles, which become visible in the dark field.

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## STUDIES IN MULTIPLE SCLEROSIS

### I. THE HISTOGENESIS OF EXPERIMENTAL SCLEROTIC PLAQUES AND THEIR RELATION TO MULTIPLE SCLEROSIS *

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A large number of cases of an acute disease characterized by areas of demyelination (usually perivascular) with relative preservation of axis cylinders and infiltration with round and glial cells are now on record.[1] This disease or group of diseases has been called by various names, such as acute multiple sclerosis, acute disseminated encephalomyelitis and degenerative encephalopathy. In many instances, the condition has followed acute infectious diseases, especially vaccinia and measles. A similar disease, occurring spontaneously in dogs, was described by Perdrau and Pugh.[2] It was produced experimentally in dogs by Claude [3] by the injection of minimal doses of tetanus toxin, and by Ceni and Besta [4] by Aspergillus spores. We have succeeded in confirming Claude's work.[5]

The relation between this group of diseases and multiple sclerosis has been the subject of lively controversy ever since cases of acute demyelination were first reported. On the one hand there are those, of whom Pette [6] is an able modern representative, who believe that these encephalomyelitides are true infections of cerebral tissues by an organism and that multiple sclerosis is a chronic form of the same process. On the other hand, such authorities as Spielmeyer [7] and Hassin [8] point out certain differences between the acute and the sclerotic process, and remain skeptical as to the relation between the two and the infectious nature of either. Conclusive evidence from clinical or pathologic material is still lacking, as it was when the argument arose two generations ago between Leyden and Westphal. Most patients afflicted with the acute disease either recover completely or die within a few weeks. Recovery with residual symptoms is unusual, though not unknown.[9] If the char-

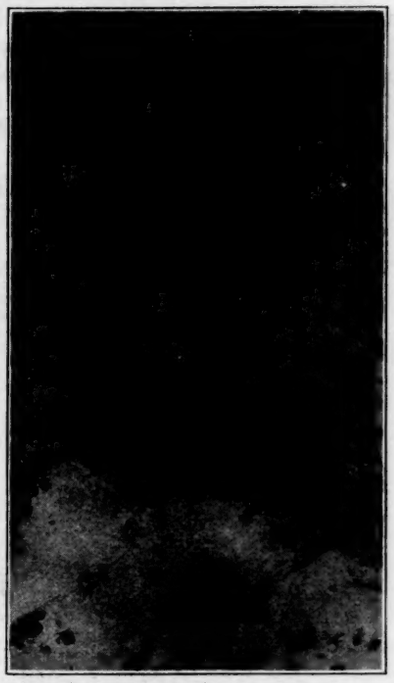

Fig. 1 (dog 8).—Tetanus toxin encephalomyelitis, twenty-nine days after the first inoculation. Lymphocytic and glial infiltration along the root of the eleventh cranial nerve. Cresyl violet stain; reduced from a photomicrograph with a magnification of 300 diameters.

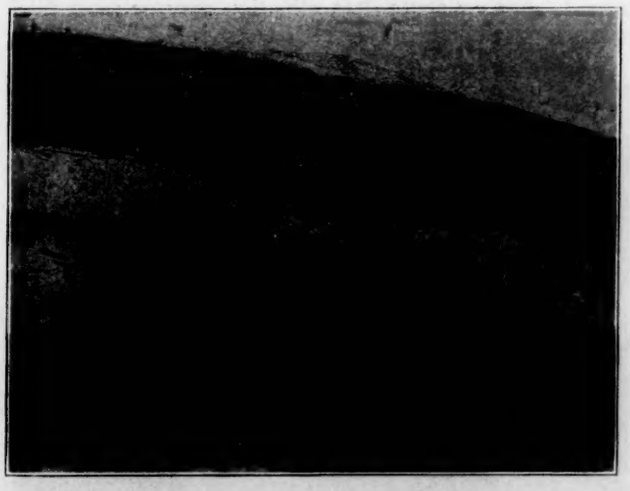

Fig. 2 (dog 8).—Longitudinal section of spinal cord, showing perivascular demyelination. Weigert-Pal stain; reduced from a photomicrograph with a magnification of 5 diameters.

18. Spiller, W. G.: Tr. A. Research in Nerv. and Ment. Dis. **2**: 176, 1921.

* Read before the Section on Nervous and Mental Diseases at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 11, 1931.

* From the Neurological Unit, Boston City Hospital, and the Department of Neuropathology, Harvard University Medical School. This work was done with the aid of the Multiple Sclerosis Fund of Harvard University.

1. Recent references given by Grinker, R. R., and Bassoe, Peter: Disseminated Encephalomyelitis: Its Relation to Other Infections of the Nervous System, Arch. Neurol. & Psychiat. **25**: 723-747 (April) 1931.

2. Perdrau, J. R., and Pugh, L. P.: The Pathology of Disseminated Encephalomyelitis of the Dog ("The Nervous Form of Canine Distemper"), J. Path. & Bact. **33**: 79-91 (Jan.) 1930.

3. Claude, H.: Myélite expérimentale subaigue par intoxication tétanique, Arch. de physiol. norm. et path. **29**: 843-847, 1897.

4. Ceni, C., and Besta, C.: Sclerosi in placche sperimentale da tossici aspergillari, Riv. Sper. di freniat. **31**: 125, 1905.

5. Putnam, T. J.: "Acute Multiple Sclerosis" in Dogs, Arch. Neurol. & Psychiat. **24**: 640-641 (Sept.) 1930.

6. Pette, H.: Infektion und Nervensystem, Deutsche Ztschr. f. Nervenh. **110**: 221-289, 1929.

7. Spielmeyer, W.: Infektion und Nervensystem, abstr. Deutsche Ztschr. f. Nervenh. **110**: 290-295, 1929.

8. Hassin, G. B., and Bassoe, Peter: Multiple Degenerative Softening Versus Multiple Sclerosis, Arch. Neurol. & Psychiat. **7**: 613-628 (May) 1922.

9. McAlpine, D.: Acute Disseminated Encephalomyelitis, Sequelae and Relationship to Disseminated Sclerosis, Lancet **1**: 846-852 (April 18) 1931.

acteristic picture of multiple sclerosis develops, it is difficult to be sure that the original disease belonged in the category of encephalomyelitis. Only three cases of postmeasles encephalitis have come to autopsy after a long interval from the onset. Two of these were described as showing typical lesions of multiple sclerosis ten and fourteen months respectively, after the original infection;[10] the other was described as displaying multiple foci of necrosis without plaques of demyelination, four and a half weeks after measles.[11] Claude's dog [3] and Ceni and Besta's [4] both came to autopsy in the acute stage.

Fig. 3 (dog 8).—Longitudinal section of spinal cord, including an area similar to that shown in figure 2. Axis cylinders essentially intact. Bielschowsky stain; reduced from a photomicrograph with a magnification of 5 diameters.

The problem, it seems to us, may be resolved into two main questions. The first is whether acute disseminated encephalomyelitis is an infectious disease; the second, whether acute demyelination may or must lead to a sclerotic patch if the subject survives.

Fig. 4 (dog 8).—Optic nerves. Partial demyelination and cellular infiltration. Arachnoiditis. Weigert-Pal stain; reduced from a photomicrograph with a magnification of 5 diameters.

In the present paper we deal chiefly with the second question, although some light may also be cast on the first.

10. Schlesinger, H.: Zur Frage der akuten multiplen Sklerose und der Encephalomyelitis disseminata im kindesalter, Arb. a. d. neurol. Inst. s. d. Wien. Univ. **17**: 410-434, 1909. Cramer, A.: Beginnende Multiple Sklerose und acute Myelitis, Arch. f. Psychiat. **19**: 667-683, 1888.

11. Walthard, K. M.: Spätstadium einer "Encephalitis" nach Masern, Ztschr. f. d. ges. Neurol. u. Psychiat. **124**: 176-193, 1930.

## METHODS

Experimental demyelination has been obtained by three methods: by the injection of minimal doses of tetanus toxin as described by Claude,[3] by carbon monoxide poisoning as used by Meyer,[12] and by certain types of embolism. All three methods are uncertain, and satisfactory lesions have been obtained in only a small proportion of the animals used. The animals were allowed to survive for varying periods up to a year. The gross observations in brain and cord were insignificant in all cases. The routine histologic method consisted in formaldehyde fixation and celloidin embedding, and staining successive sections from the same block for cells with cresyl violet or hematoxylin and eosin, for myelin by Loyez's method, and for axis cylinders by Davenport's method. In other instances, frozen sections were stained with the Spielmeyer and with the Bielschowsky stains. When lesions were located, they were further studied with fat stains and with special staining methods, such as the methods of Pal, Cajal, Anderson, Mann and Mallory.

Fig. 5 (dog 37).—Encephalomyelitis following injection of tetanus toxin thirteen months previously. Edge of patch of demyelination in spinal cord (cut transversely). Weigert-Pal stain. Reduced from a photomicrograph with a magnification of 500 diameters.

Fig. 6 (dog 37).—Patch of demyelination in spinal cord. Longitudinal section. Courville's modification of Weigert stain; reduced from a photomicrograph with a magnification of 85 diameters.

*Tetanus Toxin Encephalomyelitis.*—These experiments will be described in more detail elsewhere. Briefly, about eighty dogs were inoculated in various ways with doses of tetanus toxin comparable to those used by Claude.[3] In two of these, encephalomyelitis developed. The first (dog 8) became ataxic and weak

12. Meyer, A. (Bonn): Experimentelle Erfahrungen über die Kohlenoxydvergiftung des Zentralnervensystems, Ztschr. f. d. ges. Neurol. u. Psychiat. **112**: 187-212, 1928.

two days after receiving 0.015 cc. of tetanus toxin intraperitoneally. Two more doses were given at weekly intervals, and with each the symptoms were exaggerated, but no new ones appeared. After the third dose the animal grew progressively worse and died about a month after the first injection. The spinal fluid showed 50 lymphocytes and a gold curve of 1233342100. Sections from the spinal cord and medulla showed many areas of perivascular infiltration with round and

Fig. 7 (dog 37).—Gliosis in the same patch. From the same block as the preceding illustration. Anderson's stain; reduced from a photomicrograph with a magnification of 85 diameters.

glial cells (fig. 1) and fewer areas of perivascular demyelination (fig. 2) with intact axis cylinders (fig. 3). There was a definite early proliferation of fixed glia also. The optic nerves showed a large patch

Fig. 8 (dog 37).—High-power photograph from the same slide from which figure 7 was taken. Note persistent axis cylinders. Anderson's stain; reduced from a photomicrograph with a magnification of 300 diameters.

of myelin destruction with cellular infiltration and thickening of the meninges (fig. 4).

The second dog received two injections of 0.015 cc. of tetanus toxin and developed ataxia and spasticity about three weeks later. Its symptoms progressed somewhat for a month but were never so severe as those of the first animal. At the end of five months, the dog appeared perfectly well. Spinal fluid taken at intervals showed slight increase in cells up to 18 and protein up to 57 and slight changes in the gold curve (1233210000) on some occasions. The animal was killed a year after the onset of symptoms. There were numerous areas of perivascular gliosis (fig. 5) throughout the optic tract, spinal cord and brain stem, but only four small areas of demyelination and glial sclerosis were demonstrated (figs. 9, 10 and 11). In these, however, there was no suggestion of regeneration of myelin. Small amounts of fat were present in the lesions.

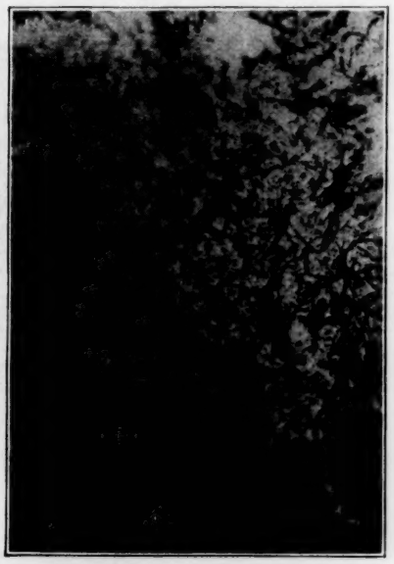

Fig. 9 (dog 37).—Encephalomyelitis following injection of tetanus toxin thirteen months previously. Proliferation of astrocytes about a small vessel in the cerebellar peduncle. Cajal stain. Reduced from a photomicrograph with a magnification of 500 diameters.

*Carbon Monoxide Poisoning.*—Meyer [12] described the perivascular demyelination that results from carbon monoxide poisoning in dogs, but he did not follow the changes longer than eighteen days. At that time, phagocytosis of particles of myelin was active; but proliferation of fixed glia was slight.

We have subjected twenty-two dogs and two cats to pure carbon monoxide. Four died at once from an

Fig. 10 (dog 77).—Carbon monoxide poisoning two months before autopsy. Patch of myelin destruction about large obstructed vessel. Weigert-Pal stain; reduced from a photomicrograph with a magnification of 5 diameters.

overdose. Two more died within a few days and at autopsy showed extensive necrosis throughout the white matter of the hemispheres. Of the remainder, eleven never showed any late symptoms or any lesions. Three showed areas of demyelination at autopsy, ten, fifteen and fifty-one days, respectively, after the last exposure. One showed a small cyst of softening but no demyelination a year after exposure. The most satisfactory experiment was that of the two months dog. In this animal, the demyelination about a large vessel was

practically complete (fig. 12), though phagocytosis was still in progress. The axis cylinders were little altered (fig. 13). There was a definite proliferation of the fixed glial cells.

*Experimental Embolism.*—The areas of demyelination in carbon monoxide poisoning always surround a large

Fig. 11 (dog 77).—Relative persistence of axis cylinders in a similar patch (from an adjacent block). Bielschowsky stain; reduced from a photomicrograph with a magnification of 5 diameters.

vessel, which is usually obstructed by a cellular plug. Meyer [12] expresses the opinion that the degeneration is of vascular origin. To test this hypothesis, attempts were made to obstruct vessels by emboli of various types. Those ordinarily used, such as starch granules or lycopodium spores, either came to lie harmlessly within the vascular net or else produced complete necrosis and cyst formation, as has been described by Bodechtel and Müller [13] and by Cone and Barrera.[14]

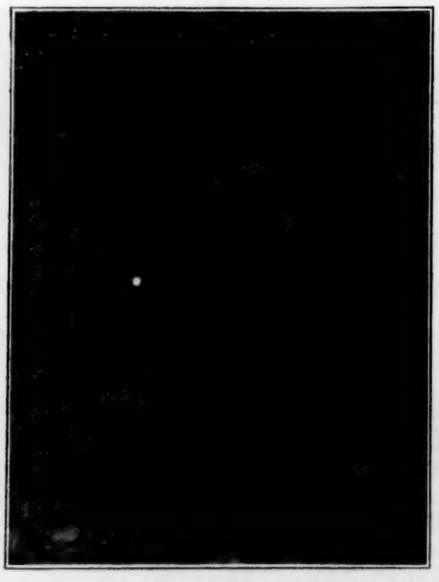

Fig. 12 (dog 30-54).—Embolism with cod liver oil emulsion twenty days before autopsy. Perivascular infiltration and proliferation of fixed glia cells about obstructed vessel in white matter of hemisphere. Neutral red stain. Reduced from a photomicrograph with a magnification of 500 diameters.

Finally, a commercial emulsion of cod liver oil was employed, in the hope that the viscous, cohesive globules would obstruct long stretches of rather large vessels, as do the thrombi in the degenerated areas after carbon monoxide poisoning.

Eight cats and seven dogs were used. The doses given were from 0.05 to 2 cc. for a cat and from 1 to 3 cc. for a dog, of emulsion, diluted with an equal amount of water, injected into each carotid. Two animals died immediately. In the others, transient paralytic symptoms occasionally occurred. The animals were killed at varying intervals. In almost all of them, mild areas of perivascular infiltration were found. Four showed satisfactory areas of demyelination at intervals of twenty days, one month, three months, four months and five months, respectively, after the injection. In the animals that were killed early, the lesions greatly resembled those already described in carbon monoxide poisoning (figs. 14 and 15). The axis cylinders were less well preserved and there was more cellular infiltration. In the older lesions, some of the myelin sheaths regained their normal appearance (fig. 16), but many naked axis cylinders were seen. Proliferation of astrocytes had begun (fig. 16).

Fig. 13 (dog 30-54).—Embolism with cod liver oil twenty days before autopsy. Demyelination. About the same vessel as that shown in figure 12. Loyez stain. Reduced from a photomicrograph with a magnification of 500 diameters.

## COMMENT

These results may be taken to indicate that myelin is more easily damaged than the axis cylinder, as a result of insufficient blood supply and perhaps because of other adverse circumstances. However, one is not compelled to postulate any specific virus, toxin or ferment to account for myelin loss: it appears to be more a matter of quantity and distribution of injury than of quality.

Further, it appears that regeneration of completely destroyed myelin does not occur in the central nervous system of adult animals, even when the axis cylinder is intact. It may be objected that the period of experiment is too short to allow any sweeping conclusions. However, a year is a long time in a dog's life, and five months in a cat's. Myelination is completed in the new-born animal within these periods.

Wherever myelin is destroyed in these experiments, there is proliferation of fixed glia. It may be objected that in no instance is the gliosis as intense as that usually seen in multiple sclerosis. However, the amount of gliosis in that disease is extremely variable and some-

13. Bodechtel, G., and Müller, G.: Die gewebliche Veränderungen bei der experimentellen Gehirnembolie, Ztschr. f. d. ges. Neurol. u. Psychiat. **124**: 764-793, 1930.

14. Cone, William; and Barrera, S. E.: The Brain and the Cerebrospinal Fluid in Acute Aseptic Embolism: An Experimental and Pathologic Study, Arch. Neurol. & Psychiat. **25**: 523-547 (March) 1931.

times slight. The histologic pictures produced in these experimental animals may be matched with great accuracy in almost any early case of multiple sclerosis.

Two of these diverse types of injury have a factor in common; namely, the obstruction of a relatively long stretch of a relatively large vessel. In the encephalitis following injection of tetanus toxin, in multiple sclerosis and most strikingly of all in acute myelitis and encephalomyelitis, cellular plugs are often found within the central vessel of a lesion. They are not ordinary thrombi; they are not constant, and they are occasionally seen in other diseases without demyelination, but it is conceivable that they form a link in the chain leading to myelin loss and sclerosis.

## CONCLUSIONS

1. Disseminated areas of myelin loss with perivascular infiltration and reactive gliosis may be produced in dogs by the injection of minimal doses of tetanus toxin. The lesions resemble those seen in some cases of human encephalomyelitis.

2. The myelin loss is permanent up to a year from the time of inoculation. The gliosis appears to be progressive.

3. Areas of myelin destruction with reactive gliosis may be produced in dogs by carbon monoxide poisoning. The myelin shows no sign of regeneration within two months.

4. Similar areas of demyelination and gliosis may be produced by embolism with cod liver oil emulsion. Destroyed myelin is not regenerated at the end of five months, but gliosis is progressive.

5. Vascular obstruction appears to play a part in the production of lesions of the two latter types; also perhaps in the first.

Fig. 14 (cat 85).—Embolism with cod liver oil emulsion five months before autopsy. Perivascular demyelination. A few fibers have completely recovered their sheaths; other sheaths are completely destroyed. Spielmeyer stain; reduced from a photomicrograph with a magnification of 500 diameters.

6. All three types of lesion resemble closely the "early" plaques of multiple sclerosis.

7. It is not necessary to postulate a specific virus, toxin or ferment to account for the histologic appearances seen in multiple sclerosis.

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## ABSTRACT OF DISCUSSION

### ON PAPERS OF DR. WEIL AND DRS. PUTNAM, MCKENNA AND MORRISON

DR. GEORGE B. HASSIN, Chicago: I have no experience with this kind of experimental work. I agree that multiple sclerosis is due not to an infection but to a toxin. As to the demonstration of Drs. Putnam, McKenna and Morrison, it must be conceded that various features of multiple sclerosis, loss of myelin, with the preservation of the axons and subsequent glial reactions, occur in some vascular lesions, in carbon monoxide poisoning and in tetanus, and may be caused by many other toxins. Yet the phenomena are not those of multiple sclerosis. Being often associated with marked infiltrations, they may be classified also as encephalomyelitis. Because of the presence of foci of demyelination and the rapid onset, they are named acute multiple sclerosis. Some investigators are frank enough to consider encephalomyelitis, multiple sclerosis and acute multiple sclerosis one disease process, as an acute or subacute inflammation of the central nervous system. On the basis of experimental studies, they would eliminate multiple sclerosis from the group of independent diseases. Such an assertion is made regardless of the fact that in animals nobody ever observed multiple sclerosis or succeeded in producing it experimentally, but one might have observed in them so-called acute multiple sclerosis or encephalomyelitis. The patches produced experimentally probably looked like those seen in multiple sclerosis, but when one compares the early and late plaques of human multiple sclerosis with those demonstrated by Dr. Putnam, one may see that they are not the same. Even in cases of so-called acute multiple sclerosis, represented in human pathology by post-vaccinal encephalitis, the patches are entirely different from the early patches seen in multiple sclerosis. In the latter the nerve destruction is followed by a massive glial reaction; in the former the lesions of the parenchyma and the glia and the mesodermal reactions all occur simultaneously. Grouped around the blood vessels, the marked infiltrations may absorb. Such patches never occur in multiple sclerosis, but they may somewhat resemble them macroscopically. Microscopically, as my pictures show, they do not.

Fig. 15 (cat 85).—Relative persistence of axis cylinders in the same lesion (section from the same block). Bielschowsky stain; reduced from a photomicrograph with a magnification of 500 diameters.

Fig. 16 (cat 85).—Perivascular gliosis in a similar lesion. Cajal's stain; reduced from a photomicrograph with a magnification of 500 diameters.

DR. R. M. BRICKNER, New York: Some work which I have done at Columbia is perhaps comparable with that presented by Dr. Weil. I started my studies on multiple sclerosis also by using rat cords and immersing them in fluids taken from multiple sclerosis patients as well as from normal subjects, and in that instance we used the blood plasma from the patients and from the normal persons and we thought that we found a considerably greater degree of destruction of the myelin after the cords had been immersed in the multiple sclerosis plasma. This method, however, struck me, with what experience I had with it, as being not quantitative enough, not definite enough

for use, if one wanted to try to study the properties of the agent which was causing this destruction of myelin. I would like to say that I proved to many a supporter of the theory that the destruction of myelin is not caused by an infectious agent but by what we generally refer to as toxin; namely, a substance which when it comes in contact with myelin, will possibly destroy it. In a further effort to try to delineate some of the properties of this substance, the hypothesis was formulated that an abnormal lipasic activity in the blood was responsible for the destruction of the myelin. This does not mean that there is an actual abnormal lipase present. The meaning is that there is abnormal lipasic activity. It is quite possible that the normal blood lipase, being supported by products which do not belong there, can behave in an abnormal manner. Proceeding along these lines, I thought I had demonstrated such abnormal activity, and I was pleased that Crandall and Cherry, in Illinois, found the same result with a totally different method, and working independently. I should also like to follow Dr. Hassin's line of statement and comment on the paper of Drs. Putnam, McKenna and Morrison, as I understood it, that despite the ability of the various poisons to produce changes in the myelin sheath, cannot one still say that the disease multiple sclerosis, which after all is a pretty characteristic disease, has a poison, a toxin or a toxic condition of its own?

DR. FRANK R. STARKEY, Detroit: I wish to speak especially on the clinical side of multiple sclerosis: It is well known that there are various febrile conditions such as measles and scarlet fever and encephalitis, especially, that leave sequelae that resemble closely those of multiple sclerosis. I have had, and have at the present time under my care, patients that have all the classic symptoms of multiple sclerosis, namely, pallor of the temporal sides of the disks, intention tremor, scanning speech, sagging of the lips, and peculiar gait. I have not had an opportunity to make histologic examination in these cases, but I should like to ask whether any one present has had an opportunity to do so. I believe that if we are thorough in this particular line of research we shall throw some light on the histopathology of multiple sclerosis.

DR. CHARLES DAVISON, New York: I, too, had an opportunity to observe the work of Chevassut and James Purves Stewart last summer at the Westminster Hospital in London. I was not sufficiently enthusiastic to repeat the work but I followed the literature closely from that time on. A French worker, whose name escapes me, and Carmichael from the National Research Council in England came to the same conclusion that Dr. Weil did. The organisms found by Miss Chevassut in multiple sclerosis were found in the spinal fluid of other neurologic disorders as well as in normal spinal fluids. If the results of Dr. Weil's experiments concerning the effect of concentrated urine on the spinal cord can be compared with the pathologic picture seen in multiple sclerosis, there is one more argument against the organismal theory of multiple sclerosis. I am taking the privilege of discussing some slides Dr. Weil has shown me personally from cases of multiple sclerosis with which he has experimented using the serum, the plasma, as well as the cerebrospinal fluid. His experiments, as well as the previously advanced theories, favor the conception that this disease is a toxic and not an infectious process. Drs. Putnam, McKenna and Morrison showed some slides from experimental sclerotic plaques. In these slides they have shown what appear to be perivascular infiltrations. I should like to ask whether any fat stains were made from these sections. The last two slides of Dr. Hassin also showed a typical perivascular infiltration. I had the opportunity of studying cases of multiple sclerosis and found types of similar round cells, but the same round cells stained for fat proved that they are compound granular corpuscles and not typical round cells seen in infectious diseases of the nervous system. One has to be guarded in making a diagnosis of an infectious disease of the nervous system in the absence of carefully stained fat preparations.

DR. ARTHUR WEIL, Chicago: I have only two short remarks to make. The one is on the relationship between acute disseminated encephalomyelitis and multiple sclerosis to which Dr. Hassin referred. Drs. Putnam, McKenna and Morrison mentioned some excellent work that has been done on the comparative histologic study of these two diseases. Walthard pointed out that there is a definite difference in the histologic picture presented in the different types. It is known that the axons in multiple sclerosis are relatively intact and that the demyelination with glia proliferation predominates. In acute encephalomyelitis following measles, however, there is a severe destruction of the axis cylinders in the demyelinated areas, which, quite different from multiple sclerosis, are arranged perivascularly. I should also like to say some words with regard to Dr. Brickner's remarks. At present we can only define ferments and recognize them by their specific action, their sensitiveness to heat and their dependence of a given environment. Brickner stated that, if serum from multiple sclerosis patients acts on lecithin emulsions, a marked increase in acidity is noted. Oxalated plasma does not produce such a marked lecithin splitting action; it shows, however, marked demyelinating action on the spinal cords of rats. He concluded that the lecithin splitting ferment and the demyelinating agent are the same. The fact that addition of oxalate inhibits the action of the first but not the destructive action on the lipids of the myelin sheaths is not in favor of such a theory. Furthermore in my experiments with highly active pancreas extract I was never able to produce demyelination of rats' spinal cords with the lipases present.

DR. TRACY J. PUTNAM, Boston: In regard to Dr. Davison's question, fat stains show trifling amounts of fat—scarcely two or three cells about the vessel—not the great swollen fat cells that are common in areas of acute and marked degeneration. As to whether this process is an "itis" or "opathy" I don't pretend to say. As long as we agree as to the histologic sequence and as to the etiology, I am quite content to leave terminology to some one else. In regard to Dr. Hassin's comments, I think we are perhaps not as far apart as it seems. I do not say that the late stages of this myelin destruction exactly simulate all the lesions of multiple sclerosis; it would be rather remarkable, I think, if lesions produced in a year, at the most, would simulate the lesions of multiple sclerosis that have existed for five, ten or even twenty years. I do believe, however, that the later lesions with very little vascular infiltration, with practically no axon destruction evident, and with a rather lively gliosis about them, are much more suggestive of the milder lesions of multiple sclerosis than they are of any lesions, mild or intense, of the acute process which one sees within a month or so after an infectious disease. The lesions in my dog 8, which died spontaneously, closely resemble those in Walthard's case, for instance; but those in dog 37, killed after a year, reproduce in a mild degree all of the features shown in Dr. Hassin's slides and the illustrations of the article from which they are taken. I think that these experiments perhaps carry us a step nearer to multiple sclerosis and indicate that the difference is one of quantity and intensity rather than an entirely qualitatively different process.

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**Amount of Radioactive Substance Necessary to Destroy Life.**—In order to indicate the infinitesimal amount of radioactive substance necessary to destroy life, the following illustration may be cited: A milligram of radium bromide is not much larger than a small grain of sand. One microgram is only one thousandth as large, is invisible, and cannot be detected by any known chemical method. It is necessary to have only ten micrograms, or one hundred thousandth of a gram, distributed over the entire skeleton to produce a horrible death years after it has been ingested. This is interesting when it is recalled that the fatal dose to man of the toxin produced by Bacillus tetani, one of the most powerful soluble poisons known, is 0.22 mg., or about $\frac{1}{3000}$ grain. Gettler, after examining the bones of a dial painter, exhumed five years after death for litigation purposes, in whom he found 50 micrograms or $\frac{1}{20}$ of a milligram of radium distributed over the entire skeleton, made some interesting calculations. He estimated that one quarter of an ounce of bone from this painter contained about $\frac{1}{50,000}$ of a milligram of radium. The number of atoms of radium present in this amount of bone was $5.0 \times 10^{13}$ or 50,000 billion. For every atom of radium there were 600 million molecules of bone tissue. This one quarter of an ounce of bone ejected 1,000 alpha particles per second.—Martland, H. S.: The Occurrence of Malignancy in Radioactive Persons, *Am. J. Cancer*, October, 1931.

# POSTOPERATIVE GANGRENOUS ULCER OF THE ABDOMINAL WALL *

FRANK S. LYNN, M.D.
BALTIMORE

It has been wisely said that all diseases should be reviewed every five years, for in making such a review one is able to evaluate the symptoms that are currently stressed and attach to them their proper importance. At the same time, complications once frequent are found to be becoming less so, and others thought to be infrequent or never heard of are brought to the front. Then, too, one finds that the management of disease processes and their complications, once looked on as very complex, are becoming more and more simplified.

No doubt this thought prompted the recent extensive review of our old constant companion, appendicitis. Quite a mass of writings has come forth in the past few years dealing not so much with the symptomatology as with the management and mortality. The latter has not assumed the downward curve that every one thought it should with the better training in diagnosis and treatment. It is realized that this is due to the failure to recognize and institute promptly the proper treatment for its complications for, after all, these complications keep up the mortality and morbidity rates.

In any abdominal operation requiring drainage the common offenders in adding to the surgeon's worries were intestinal obstruction, fecal fistula and postoperative hernia. Since 1924, however, there has been another added to the list. In that year Cullen [1] reported, and since that time there have appeared from time to time reports of a condition which to me has proved most interesting and which I think is more prevalent than a search of the literature indicates. The etiology of the condition has aroused the interest of various men and is still a moot question. In its treatment, a long gamut of antiseptics and germicides has been resisted, putting to task the ingenuity of some very resourceful surgeons. The pathologic condition presents a definite picture as to its progress, the tissue involved, and the process through which it passes.

Each writer who has discussed this condition has done so under names differing in some small detail. In this paper I shall use the simplest title that the subject will bear.

Postoperative gangrenous ulcer of the abdominal wall has been considered at various times since 1924, in which year Cullen [1] of Baltimore published the first reported case. From time to time since then, various men have discussed the subject and have enlightened us materially in its recognition and management. In a number of these reports there have appeared descriptions of cases not coming strictly within the scope of this condition. For example, Meleney,[2] who has given the most comprehensive reports on gangrene of the skin, has included in his publications gangrene resulting from the injection of scarlet fever antitoxin, having seen fourteen cases of that kind in the past five or six years. Gatewood and Baldridge [3] have reported six such cases. Meleney [4] has also given most enlightening information on gangrene of the scrotum and penis, which is due to Streptococcus hemolyticus and which he had the opportunity of studying in China, where the condition is rather common.

Again there has been a tendency to include postoperative gas bacillus infections of the abdominal wall. These cases are very rare and have been reported by Shearer [5] of Washington (one case in 1929) and by Butler [6] of Sayre, Pa. (two cases in 1926).

In my search of the literature dealing with postoperative gangrenous ulcer of the abdominal wall the number of cases revealed is not large, but through personal communications I have learned of additional cases that have not been reported. This experience justifies the statement that the condition is more frequent than the literature indicates. Again, I think this impression has justification in the fact that it is only seven years since I first heard of these ulcers and all the literature has been published in that short time.

*Summary of Cases Reported in Literature*

| Surgeon | Cases | Age | Sex* | Operation | Result |
|---|---|---|---|---|---|
| Cullen [1] | 1 | 50 | ♂ | Appendiceal abscess | Cured |
| Borelli, C.: Gior. ital. d. mal. ven. 65: 326 (April) 1924 | 1 | 46 | ♀ | Pelvic inflammatory disease | Cured |
| Brewer and Meleney [10] | 3 | 32 | ♂ | Appendectomy | Cured |
| | | 63 | ♀ | Upper right quadrant abscess | Cured |
| | | 64 | ♂ | Appendectomy | Cured |
| Alexander, E. G.: Ann. Surg. 84: 461 (Sept.) 1926 | 1 | 53 | ♂ | Appendectomy | Cured |
| Mayeda [11] | 1 | 38 | ♂ | Appendectomy | Cured |
| Shipley [12] | 1 | 50 | ♂ | Appendiceal abscess | Cured |
| Gordon [16] | 1 | 38 | ♂ | Appendectomy | Cured |
| Cole and Heideman [14] | 1 | 34 | ♂ | Appendectomy | Cured |
| Horsley [13] | 1 | 67 | ♂ | Intestinal obstruction | Cured |
| Mitchell, J. F.: read before Baltimore City Medical Society, Dec. 5, 1930 | 1 | 70 | ♂ | Appendectomy | Died of pneumonia |
| Ballin and Morse [8] | 1 | 52 | ♂ | Appendectomy | Cured |
| Terry, C. C.: Personal communication to the author | 1 | 32 | ♂ | Appendectomy | Cured |
| Clinton [15] | 1 | 37 | ♂ | Appendectomy | Cured |
| Moscheowitz [15] | 1 | 48 | ♂ | Appendectomy | Cured |
| Porter [15] | 3 | 35 | ♀ | Gallbladder | Cured |
| | | Unknown | | Unknown | Cured |
| | | Unknown | | Unknown | Cured |
| Freeman: Tr. Am. S. A. 1930 | 1 | 39 | ♀ | Gallbladder | Died |
| Lynn | 1 | 62 | ♂ | Appendiceal abscess | Cured |

* In this column, ♂ indicates male; ♀, female.

To date there have been reported in the literature or through communication with various writers twenty-one cases of postoperative gangrenous ulcer of the abdominal wall. Of these, fifteen have occurred in males and fourteen have followed operations for appendicular abscess or peritonitis. Ten patients have been above the age of 45 years.

I am not including in this list of cases those of Christopher [7] (one case in 1924) and Ballin [8] (one case in 1931) in which an identical form of ulceration followed a major thoracotomy for empyema and in which a major part of the chest wall became involved,

* From the Department of Surgery, University of Maryland School of Medicine and College of Physicians and Surgeons.

* Read before the Section on Surgery, General and Abdominal, at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 12, 1931.

1. Cullen, T. S.: Surg. Gynec. Obst. 38: 579 (May) 1924.
2. Meleney, F. L.: Ann. Surg. 91: 287 (Feb.) 1930.
3. Gatewood, W. E., and Baldridge, C. W.: Tissue Hypersensitiveness Following the Administration of Toxin-Antitoxin, J. A. M. A. 88: 1068 (April 2) 1927.
4. Meleney, F. L.: Hemolytic Streptococcus Gangrene, Arch. Surg. 9: 317 (Sept.) 1924.
5. Shearer, J. P.: Ann. Surg. 90: 1114 (Dec.) 1929.
6. Butler, D. D.: Ann. Surg. 84: 841 (Dec.) 1926.
7. Christopher, Frederick: S. Clin. North America 4: 795 (June) 1924.
8. Ballin, Max; and Morse, P. F.: Am. J. Surg. 11: 81 (Jan.) 1931.

nor the case of Warfield [9] (one case in 1927), in which the condition occurred in an obese woman suffering with alcoholic neuritis.

One is impressed with the fact that in all the cases reported, except Warfield's, the patient had an acute inflammatory process requiring surgical intervention and the institution of drainage. Because of prolonged drainage and restricted diet they were all invariably

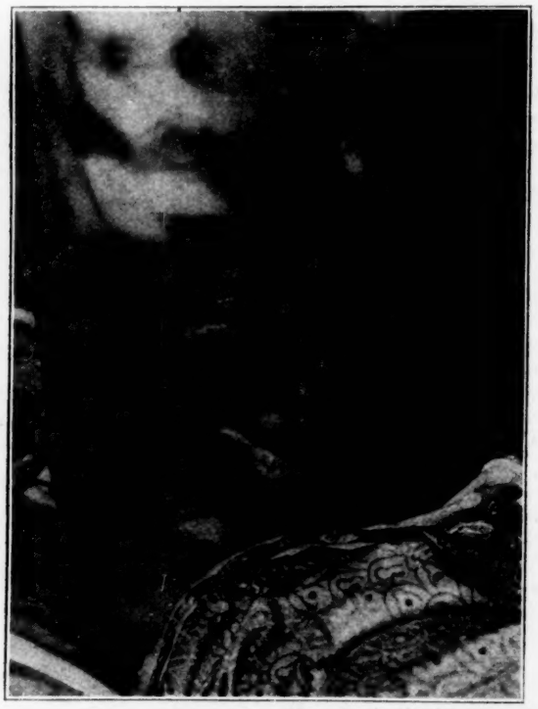

Fig. 1.—Spreading progressive gangrenous ulcer of abdominal wall.

in a very run down general condition when the ulcer appeared. It is also interesting to note that in 50 per cent of the cases the patient was 45 years old or over.

It would be enlightening to know in how many of these cases an ice cap was applied to the abdomen following the operation. It cannot be denied that cold lowers the local resistance of the individual, and yet in some clinics the use of the ice cap postoperatively is a routine procedure. I, myself, am partial to the hot water bottle or electric pad.

No specific factor in producing these gangrenous ulcers has as yet been found. A number of different organisms have been isolated in the various cases reported. Cullen [1] found Streptococcus brevis; in the cases reported by Brewer,[10] the most thorough bacteriologic studies were made by Meleney.[10] This investigator was able to reproduce the ulcers in animals.

In the course of his investigation, he was able to find the nonhemolytic streptococcus, the hemolytic staphylococcus and a diphtheroid bacillus. When the first two were inoculated separately into animals, very little reaction occurred. When the streptococcus and Staphylococcus aureus were injected together, gangrene was produced. From these results Meleney [10] drew the conclusion that a "symbiotic function or a combination of functions of these two organisms may be necessary for the production of gangrenous ulcers. The rarity of its occurrence clinically may be explained by the necessity for the coincidence of two such organisms in the wound. The streptococcus is much more rare in its occurrence than the Staphylococcus aureus and might easily be overlooked in routine cultures."

In the case of Mayeda,[11] a diphtheroid bacillus was found and thought to be the causative factor in the production of the ulcer and to have reached the abdominal wall from the appendix. In Shipley's [12] case only a nonhemolytic streptococcus was isolated. Horsley [13] found the staphylococcus, streptococcus, colon bacillus and a diphtheroid bacillus. In the case forming the basis of this paper, there was found at the time of operation a streptococcus, and two months after operation, when the case first came under my care, Staphylococcus aureus and a bacillus having no specific reaction on sugar were found.

One of the most interesting cases reported is that of Cole and Heideman.[14] Their patient, a man, aged 34, had an appendiceal abscess drained. A gangrenous ulcer of the abdominal wall developed and in the course of their bacteriologic studies they were able to isolate an ameba. So closely did their case resemble all others reported that they are inclined to believe that the etiologic factor is the same.

However, the investigation of Meleney [10] did not bear out this conclusion, and a further consideration of

Fig. 2.—Method of cauterization, the cautery knife extending well into the healthy tissue.

his observations is most convincing. While he thinks that the streptococcus and staphylococcus are necessary for the production of these ulcers, he does not venture

9. Warfield, L. M.: Ann. Clin. Med. **5**: 884 (March) 1927.
10. Brewer, G. E., and Meleney, F. L.: Ann. Surg. **84**: 438 (Sept.) 1926.
11. Mayeda, Tomosuke: Deutsche Ztschr. f. Chir. **196**: 311 (Nov.) 1926.
12. Shipley, A. M.: Ann. Surg. **87**: 245 (Feb.) 1928.
13. Horsley, J. S.: Intussusception Due to Intestinal Lipoma in Adult, Followed by Gangrene in Abdominal Wall, Arch. Surg. **18**: 882 (March) 1929.
14. Cole, W. H., and Heideman, M. L.: Amebic Ulcer of Abdominal Wall Following Appendectomy with Drainage, J. A. M. A. **92**: 537 (Feb. 16) 1929.

the opinion as to which is the essential one in the production of the gangrene. His examination of the margin of the ulcer and the tissue removed some distance from the ulcer showed that the staphylococcus was present only in the margin while the tissue of the cut margin yielded the streptococcus, and he set forth the following explanation, which is generally accepted:

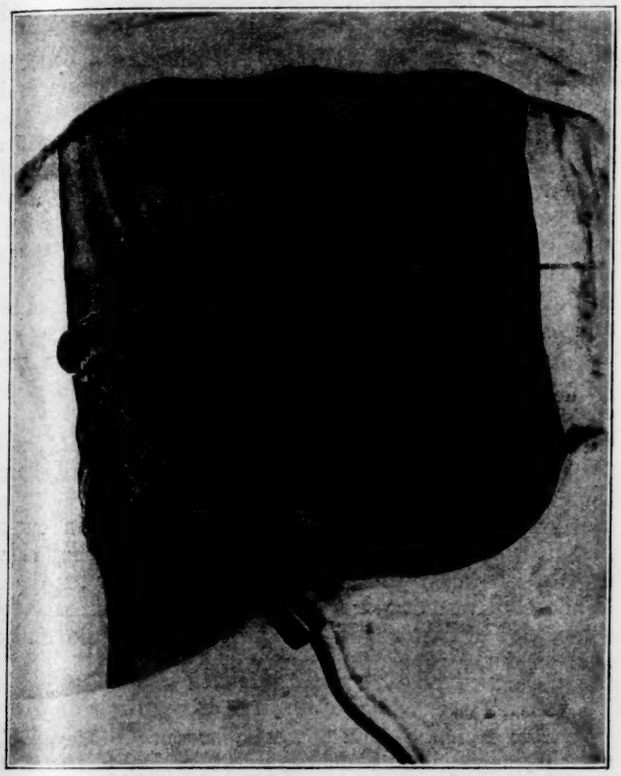

Fig. 3.—Undermining of the necrotic skin edges with a cautery knife.

"The infection with streptococcus prepared the way for gangrenous process, but for its actual production a second organism was necessary—in this case the Staphylococcus aureus."

From this brief review of the various etiologic factors found, one realizes that this offers an interesting field of investigation for the bacteriologists.

### CHARACTERISTICS OF THE LESION

A week or two after operation there appears along the margins of the wound or in the stitch holes of the skin a dusky red discoloration which rapidly becomes edematous, dark and necrotic, and the edges of which are undermined. This sloughing tissue becomes white and there is a seropurulent discharge. Beyond the sloughing zone one notices the condition spreading slowly, and the normal skin becomes swollen and gradually takes on a dark reddish hue. While this is going on the original operative wound is healing and in most instances is entirely healed by the time the ulcer is well established. In most cases the resultant scar is not involved, and it has been observed that a halo of normal skin surrounds the scar. While in my case the umbilicus also was involved, some have reported the umbilicus as uninvolved and yet surrounded by widespread ulceration. Again in the base of the ulcer, which is very granular, small pink areas have been observed which on examination have proved to be islands of young epithelium. Because of the extensive and destructive tendencies of the ulcer, it has been called carbuncular-like, gangrenous and serpiginous.

None of these ulcers, except in the case of Horsley,[13] have extended any deeper than the muscular aponeurosis. In no case thus far reported was a fecal fistula associated with the condition, and there is no history of diabetes or syphilis being present.

### SYMPTOMS

These patients usually have a mild degree of fever, the average being 100 F., but in some cases reported the temperature has gone to 102.5 There is a mild acceleration of the pulse rate and a moderate leukocytosis. In the region of the ulcer these patients have suffered discomfort varying from a mild burning to severe pain, but what is most dreaded by them is the change of dressings. In some of the cases reported a light gas anesthesia was necessary to carry out the dressing of the ulcer properly. The patient loses weight, has no appetite and becomes discouraged; his expression reveals his mental state of hopelessness.

### DIAGNOSIS

As there are certain complications arising in and around a wound through which pus is drained which need more or less attention than is required in the treatment of progressive gangrenous ulcers, these conditions should be borne in mind in making a differentiated diagnosis. The most frequent complication is a simple

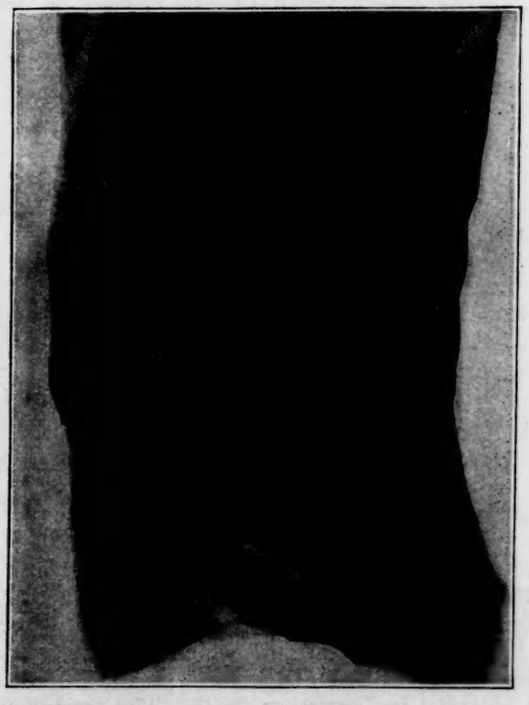

Fig. 4.—The ulcer ten days after cauterization and ready for skin grafting.

wound infection, which shows up in a few days with an upshot of fever and puffiness of the wound and which is usually checked by the removal of a suture or two. Erysipelas is sudden in its onset, ushered in with a chill, and rapid in its progress, with no tendency to gangrene. The third and most serious condition to be thought of is gas bacillus infection, which is quite rare but comes on suddenly with severe symptoms and prostration of the patient. From the wound there is a dirty brown, foul smelling discharge usually with bubbles of

air and crepitation of the skin around the wound. Here the treatment must be prompt and heroic.

### PROGNOSIS

Of the twenty-one cases that have thus far come to my attention, two patients died, one, the oldest in the series, a man, aged 70, who developed pneumonia after the arrest of the gangrenous process. The duration of the condition from the time of onset to complete healing has varied from two to twenty-two months. The methods of treatment carried out have influenced the duration of the condition. While the mortality rate of the cases available is 5 per cent, there are no doubt other cases not reported which have been fatal and would therefore raise this rate; at least I think that a reasonable assumption.

### TREATMENT

Before taking up what is considered the most efficient method of checking and curing this condition, I shall

Fig. 5.—The ulcer completely healed showing the remains of the pinch grafts.

briefly review some of the agents that have been used in the treatment. While the first case reported by Cullen [1] in 1924 was under treatment in the latter part of 1922, the first case in which the condition was encountered was that of Clinton [15] in the Buffalo General Hospital in December, 1921. The treatment carried out here which finally proved effective was a 6 per cent solution of sodium chloride applied to the margins of the wound, after powdered arsphenamine had failed. Foreign protein in the form of milk has been tried with no encouraging results. The use of most of the antiseptics that every one has heard of has been disappointing and the use of heliotherapy of various sorts has been no more promising, except in the case of Gordon,[16] in which a quartz light was used. Probstein and Seelig [17] report beneficial results from the use of blood from immunized donors, in one case involving the chest wall. The agent which has given most prompt and encouraging results is the cautery. Cullen,[1] Brewer,[10] Porter,[15] Moschcowitz,[15] Shipley,[12] Ballin [8] and I have been able to check the process and prepare the ulcer for skin grafting when this was deemed necessary. In the use of the cautery or electrotherm knife the instrument should be passed through healthy skin well beyond the gangrenous edges. When the ulcer has been completely circumscribed the knife is then passed beneath the edges, freeing the zone between the cauterized incision and the margin of the ulcer. By means of the electrotherm knife this can be cauterized at the same time; if not, the cautery should be run over the raw surfaces. The latter procedure not only destroys the infection along the edges of the ulcer but checks any hemorrhage that might occur, and in some cases reported the bleeding has been quite troublesome. After this cautery excision, moist dressings should be applied and changed daily. Besides checking the progress of the pathologic process, a striking result after the removal of the gangrenous margin is the immediate cessation of pain.

In all cases in which the cautery has been used, not only has the ulcer itself responded satisfactorily but the general condition of the patient has rapidly become vastly improved. The base of the ulcer in most instances has been in such good condition that skin grafting could be resorted to within a week or ten days. While skin grafting has not been found necessary by some, the utilization of this procedure has no doubt shortened the time of healing.

### REPORT OF CASES

My first experience with this condition came in May, 1927, when there was admitted to the service of Dr. Shipley [12] at the University Hospital, Baltimore, a man with a large progressive ulcer of the abdominal wall. The patient had been operated on four months previously in another city for an appendiceal abscess. After admission, the entire area was painted with mercurochrome-220 soluble for six days without any noticeable improvement. As the cautery had checked the advancing ulceration in Cullen's [1] case, reported three years previously, this was used with beneficial results.

Two years after I had seen Shipley's [12] case there came into my service at the University Hospital, Baltimore, a man, aged 62, who two months previously had had an appendiceal abscess drained through a McBurney incision at another hospital. Two cigaret drains and two rubber tubes were used for drainage. No attempt was made to remove the appendix, and the incision was left wide open. The cultures from the abscess were negative, but the smears showed a streptococcus. The patient left the hospital one month after drainage of the abscess with slight ulceration about the wound. He returned home and in spite of frequent dressings and cleansing of skin the ulcer grew progressively worse. At the same time the abscess cavity healed. The patient was becoming more and more discouraged because he was getting no better and because of his dread of the change of dressings. This went on for five weeks, when he came under my care, Aug. 14, 1929. The temperature was 101.2 F.; pulse, 112; respiration, 20; red blood cells, 4,300,000; white blood cells, 15,000; hemoglobin, 65 per cent. The urinalysis and the Wassermann test were negative. There was present an ulcer extending from the posterior axillary line on the right across the abdomen to the anterior axillary line on the left, from the costal margins above to the pubis below. The scar of the operation was surrounded by skin, but the umbilicus could not be identified. Two days later, under gas and oxygen anesthesia, the entire ulcer was circum-

15. In discussion of Brewer and Meleney (footnote 10): Tr. Am. S. A. **44**: 408, 1926.

16. Gordon, F. M.: U. S. Vet. Bur. Bull. **4**: 1045 (Dec.) 1928.

17. Probstein, J. G., and Seelig, M. G.: Surg. Gynec. Obst. **47**: 247 (Aug.) 1928.

scribed with an electrotherm knife. This was inserted well within healthy skin. The edges of the ulcer were then undermined with the knife and the strip of skin was removed. The raw surfaces were then cauterized. Gauze saturated with 1:1,000 solution of potassium permanganate was then applied as a dressing and kept constantly moist. This was changed daily.

The bacterial study showed Staphylococcus aureus and a gram negative bacillus having no specific reaction on sugar. Blood cultures were negative. Pathologic study of the tissue removed showed liquefaction necrosis and abscess formation with zones of granulation tissue. Small chromatin masses with a suggestion of peripheral rays were seen. The bodies, although small, suggested the ray fungus. Two weeks after the cauterization the ulcer was clean and healthy and epithelization was progressing around the edges, but, as the ulcer was so large, it was thought advisable to graft skin on the wound. This was done with pinch grafts. October 16, or two months after admission, the patient was discharged cured. I have seen the patient recently and he is enjoying excellent health.

## CONCLUSIONS

1. Postoperative gangrenous ulcer of the abdominal wall occurs more frequently than the literature indicates.
2. While more common than it was once thought to be, it is not likely that one person will have the opportunity to study more than one or two cases.
3. The great variety of bacteria occurring in the various cases reported indicates that thus far no specific etiologic factor has been found.
4. It is significant that most of these cases follow suppurative appendicitis.
5. The infection producing these ulcers spreads not only by continuity of tissue but also by the lymphatics.
6. Ordinary germicides and antiseptics are of no avail in checking this condition.
7. It is generally agreed that the cautery is the ideal means of combating the spread of this type of ulcer.
8. In the use of the cautery, the excision should extend well within the healthy tissue.

Cathedral and Read Streets.

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## ABSTRACT OF DISCUSSION

DR. A. M. SHIPLEY, Baltimore: Postoperative gangrenous ulcer of the abdominal wall has not been reported many times but, as Dr. Lynn says, it is much more common than reports would indicate. Two cases came to my attention within the year in the towns adjacent to Baltimore. One of the patients died. At present, one is justified, I think, in considering the condition a definite clinical entity, definite because of its characteristic appearance, definite from the standpoint of pathology, entirely definite as to treatment, and now, as a result of the work done by Dr. Meleney, it is a definite entity from the standpoint of etiology, and it is this etiologic phase that is most interesting at present. It brings up the whole subject of symbiosis and infection, and that, I think, is going to be one of the new fields of adventure for surgeons and for bacteriologists associated with surgeons in the hospitals of the country. Those of us who were in the World War were struck by the association between certain organisms. We particularly noticed that the streptococcus in association with anaerobes produced a condition of affairs that we had rarely seen before. Consider the carbuncle, for instance. Why should a carbuncle always look the same? Every surgeon recognizes a carbuncle as soon as he sees it. It is a definite clinical entity. It is as definite as a chancre in appearance. Yet it is not due to any specific organism but usually to a mixture of staphylococcus and streptococcus. Why should these organisms produce a definite lesion such as a carbuncle presents? It seems to me the natural explanation is that there must be some combination of types of organisms working together to produce some definite chemical substance which is producing the definite effect that one sees. It opens up a whole field that is interesting and fascinating. Just why or just how the symbiosis is brought about is not clearly understood. Whether one organism prepares the field for another, whether the two organisms produce separate toxins, whether these toxins activate each other, or whether the two toxins combine to form a third substance which produces the definite effect that one sees is not known. Certainly there is abundant evidence that the conception of wound infection must be changed. It used to be thought that the organisms that produce wound infections were pure parasites, that they grew only in a living host. Gradually surgeons have modified this idea. It is now known that the ordinary pyogenic organisms grow much better in a host or in material that is either dead or dying, so that something must happen to tissues ordinarily to prepare them for the action of these organisms of infection.

DR. J. SHELTON HORSLEY, Richmond, Va.: The case I had that Dr. Lynn referred to does not closely resemble pathologically the cases that he reports. Yet the etiologic factors seem to be somewhat the same. This patient was a white man, aged 67, with acute intestinal obstruction. There was intussusception due to a lipoma in the lower ileum. Dec. 14, 1927, I operated, reducing the intussusception, and removed the lipoma and did a tube enterostomy. Two days later, gangrene began at the corner of the wound and rapidly involved the whole thickness of the abdominal wall. The bowel was exposed at one point, the sutures were loose, and it was quite possible that if he coughed or sneezed he would disembowel himself. Eight days after the original operation, I excised the extensive gangrenous area with the hot electrical cautery. The hot cautery is better than the endotherm in such cases because the effect of heat is not only on the immediate tissue and bacteria but doubtless also on some bacteria that surround the zone of completely destroyed tissue; it probably kills some bacteria and attenuates others, and so forms an autogenous vaccine. A piece of inner tube from an automobile tire was sewed in the defect and supported by copper strips, for their seemed to be almost no adhesions between the bowel and the gangrenous abdominal wall. After seven days, the rubber and copper strips were removed, and the exudate and adhesions held the bowel in place. A flap was formed in stages under local anesthesia, and covered the defect. During this time the patient had to have a temporary gastrostomy, for his throat became sore and he couldn't swallow. He then made a satisfactory recovery. About four months ago I saw him. He has an abdominal hernia that is well controlled by a supporter, and is in good health. This case was reported fully in the *Archives of Surgery* in March, 1929. Bacteriologic examinations were made at different stages of the infection and almost always showed numerous bacteria, the predominating kind being gram-negative bacilli, some streptococci and diplococci. Almost every examination showed a somewhat different type of flora. It seems probable that the infection is a symbiotic one, as pointed out by Meleney and Brewer.

DR. FRANK MELENEY, New York: I believe that this condition is a good deal more common than was formerly supposed. Every abdominal surgeon is likely to run into it during the course of a year in his draining of peritoneal infections. Enough cases have now been seen and described to make it evident that it is a clinical entity which should be looked for and which should be recognized and treated early. Most of the cases that have been reported have been recognized rather late and have spread extensively, but now I think that it should be recognized soon after it develops and be removed by excision before it has spread to the extensive degree that it did in the cases which have been reported. I should like to speak particularly about the etiologic factors. There is enough evidence to indicate that the condition is due to the symbiotic or synergistic action of two different species of bacteria, both of which have to be present in order to produce the lesion. These organisms are a nonhemolytic micro-aerophilic streptococcus and Staphylococcus aureus. That was the theory which we advanced after the study of Dr. Brewer's case in 1926, and recently, in January of this year, another case came under my observation in which there were two lesions which yielded the same results. Another case with a combination of these organisms has just come to my

attention in another hospital in New York. This will be reported by Dr. Howard Patterson. I think that we are getting added information with every case to substantiate this theory. I should like to discuss quickly the slides of Dr. Brewer's case and Dr. Moore's case (which I am about to report in the *Annals of Surgery*) to show how we demonstrated the synergistic action of the bacteria in these cases. The streptococcus evidently is of intestinal origin. In Dr. Brewer's case it was found in pure culture in the exudate from the appendix abscess. In Dr. Moore's case the peritoneal exudate at first yielded the microaerophilic streptococcus with Bacillus welchii and Bacillus coli, but the last two disappeared from the wound while the streptococcus persisted. The staphylococcus appeared later. I believe that the staphylococcus came from the air, either at the time of the operation or some days later. The evidence of their combined activity did not appear until the second week. The streptococcus is the important organism, because that is found out in the periphery, in the advancing zone of the lesion, and because it is the first to appear in the lesion. The staphylococcus is not specific. Control strains of staphylococcus combined with the streptococcus may produce the lesion. We found that in our animal experiments these organisms must be inoculated at the same time. If the staphylococcus or the streptococcus is injected in pure culture on one day and the other organism on the next day, nothing takes place. It is the action of these two organisms working together which produces the lesion.

DR. THOMAS S. CULLEN, Baltimore: Much can be gained by taking stock every few years of the accumulated cases of a supposedly rare disease. I have nothing to add to Dr. Lynn's careful analysis of these cases of progressive ulcer of the abdominal wall. The more recent investigations seem to show that amebas may be the causative factor in this class of ulcers. They appeared to be the cause in some cases observed by Dr. Barney Brooks of the Vanderbilt University at Nashville. The history of my case, which seems to have been the first recorded, was briefly as follows: H. M., aged 50, who had been ill for two weeks, was admitted to the Church Home and Infirmary, Sept. 27, 1922, with fairly definite signs of appendicitis. Midway between the costal margin and the region of the appendix was a globular mass about 10 cm. in diameter. The abdominal walls over it were edematous and the abscess cavity contained at least 100 cc. of grayish, nonoffensive pus. Two days after operation, the incision looked red and inflamed, and sixteen days later had been replaced by a widely ulcerated area. Five and a half weeks after operation, the ulcer was 12 inches (30.5 cm.) in width. The only organism found was Streptococcus brevis. Ulceration was finally checked by cutting the sloughing margins completely away with a cautery knife. As soon as a healthy wound had been obtained, pinch grafts were used. The patient is well today, over eight years after operation. The case is recorded in detail in *Surgery, Gynecology and Obstetrics*, May, 1924, page 579.

DR. FRANK S. LYNN, Baltimore: I wish to emphasize that the cautery is the ideal method of treatment in these cases. All forms of germicides are of no avail in trying to check or cure this form of ulcer. The cautery must be run through the healthy zone of tissue in order to get beyond the extension of the streptococcus which is in the necrotic zone. Furthermore, the period of duration of some of these cases has varied from two to twenty-two months, and in those cases in which the duration has been shortest the cautery has been used. I further wish to emphasize the fact that in the twenty cases of which I have been able to collect reports, fifteen occurred in males; and of the twenty cases, fourteen occurred following operations for appendicitis. In the last few days, in talking to some of my friends from various places, I have learned of five other cases, and four of those cases terminated fatally. In the twenty cases cited, only one patient died, the oldest in the series, a man, aged 70, who died some weeks after the healing of the ulcer. Since this paper was prepared, I have come across a case, reported by Dr. Leonard Freeman in *Transactions of the American Surgical Association* for 1930, in a woman, aged 39, who was operated on for cholecystectomy without drainage. This patient also died. Postoperative gangrenous ulcer of the abdominal wall is much more serious than is indicated by the statistics.

# HEREDITARY JUVENILE GLAUCOMA SIMPLEX *

ROBERT H. COURTNEY, M.D.
AND
EMORY HILL, M.D.
RICHMOND, VA.

Among the hereditary diseases of the eye, glaucoma has a place. Benedikt,[1] in 1842, reported the case of an elderly man with gout and glaucoma. Two daughters of this man had glaucoma; they were dark eyed. One son had gout but escaped glaucoma because he was blue eyed. The relationship of gout to glaucoma was discussed by Bull [2] in 1909. The word "gout" seems to have covered a multitude of sins in the older days. The predisposition of dark eyes to glaucoma has been mentioned by many authors. Thus, Lange [3] in 1887 quoted Rydel, Rosas, Sichel and von Arlt as believing that glaucoma occurs in the brown eyed in the majority of cases. Lange doubted the correctness of this belief but asked whether the darker iris with its greater content of pigment might not be thicker than the light iris and impinge more on the angle of the anterior chamber. A member of the family remarked that she feels perfectly safe because she has brown eyes and only the blue-eyed members of her family have glaucoma (an inaccurate statement, as was afterward discovered both by our own observation and by that of the father of our patients who knows the family history most thoroughly).

Von Arlt [4] in 1856 said that he knew glaucoma to be inherited. He reported cases of a mother and her sisters, a daughter and mother, and a man with a father and two brothers. Under the heading "Choroiditis ex dyscrasia venosa (ophthalmia arthritica et glaucoma auctorum)" he said, "Glaucoma is the most frequent form of choroiditis and is also in general no rare disease of the eyes." This seems a strange title today, but perhaps no more strange than our gropings for the meaning of glaucoma may seem in the future to a generation which knows more of its etiology. Mooren [5] in 1867 said: "It seems almost as if glaucoma can be inherited. I have seen it in two sisters and in three sisters and a father." Other writers (Stellwag,[6] Pagenstecher [7] and others) usually dismissed the subject with a quotation from von Arlt.

Von Graefe [8] in 1869 emphasized the fact of "anticipation," meaning that the disease occurs earlier in succeeding generations. He referred to a mother and daughter who were attacked in the same year, there being twenty-six years difference in their ages. He thought the acute form more often inherited and the secondary type more apt to be associated with those developmental disturbances which act as predisposing factors (dislocation of the lens, sclerectasia posterior, cornea globosa). This does not accord with the present use of the word "secondary." Indeed, there was no very accurate classification made in the older literature, and one cannot be sure whether the chronic glaucomas were of the primary or secondary type, nor just how chronic glaucomas with acute or subacute attacks were

* Read before the Section on Ophthalmology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

1. Benedikt: Abhandl. Augenh., Breslau, 1842, p. 123.
2. Bull, C. S.: Prognosis and Treatment of Deep Lesions of the Eye, M. Rec., Dec. 19, 1908; abstr. J. A. M. A. 52: 72 (Jan. 2) 1909.
3. Lange: Glaukom und Myopie, Jahresb. Ophth., 1887.
4. von Arlt, F.: Die Krankheiten des Auges, Prague 3: 190, 1856.
5. Mooren, A.: Ophthalmologische Beobachtungen, Berlin, 1867, p. 196.
6. Stellwag: Vererbung des Glaukoms, Ophthalmologie, 1855.
7. Pagenstecher, A.: Klinische Beobachtungen, Wiesbaden, 1861.
8. von Graefe, A.: Arch. f. Ophth. 15: 3, 108, 1869.

classed. Probably hydrophthalmos, glaucomas quite definitely associated with faulty development of numerous structures of the eye, and juvenile glaucoma without apparent congenital anomalies were grouped together as examples of inherited glaucoma. It is possible that a graded series could be arranged from frank hydrophthalmos through the lesser degrees of this condition to the cases of juvenile glaucoma without manifest signs of congenital abnormality. It is also possible to associate glaucoma and such hereditary disorders as retinitis pigmentosa and aniridia.

## FAMILY HISTORY

In England and some countries of continental Europe it is not difficult to trace the genealogy of a family for many generations, but in a country as new as the United States it is difficult or impossible to find accurate information beyond the third preceding generation. Even in Virginia, with its early colonization, it is seldom that one can find a true record of all the individuals for five successive generations. Because of the not unusual clannish pride of the Scotch, and because of an apparently hereditary disease among its members, the family that we are reporting has been most meticulous in keeping an accurate record of the family lineage.

During the middle part of the eighteenth century three brothers in Scotland emigrated to America, one brother establishing himself in the foothills of Virginia. In his day he was a very wealthy man, an outstanding citizen, and from his stock have arisen some of the leaders in his country. Among his children there was one son, H. L., who married at about the age of 22 a Miss S., of about his own age. During the next eight years two children were born. When Mrs. L. was 30 she was again pregnant and during this time began to notice some failure of vision. Her visual difficulties, however, did not elicit much sympathy from the family because she had imprudently ridden a horse through a ford and gotten her feet wet during her pregnancy. A healthy child was born, but by this time the mother was blind. In subsequent years three other children were born to this blind mother. Soon after the birth of her last child Mrs. L. died from what her friends said was a poison due to her father having had cancer and her husband's father having had consumption, the two poisons being fatal even if the individual had neither disease (fig. 1).

*Second Generation.*—As stated, there were six children born to this union. Of these, four were males and two females. Of the males, two were married, two remained single, but only one of the married males had any issue. Neither of the females was married, but the history of one is interesting because of her having visited a great number of the European clinics about 1840 in search of a cure and having been put in dungeons for weeks, bled and leeched, and finally becoming insane.

*Third Generation.*—The only member of the second generation having any offspring, a male, was the father of six children, five girls and one boy. Three of the females had good vision throughout life. One female became blind before the end of the third decade of life, having an iridectomy on each eye when practically blind, while another suffered visual impairment at about 20 years of age and consulted Dr. William Thomson at the Wills Hospital in Philadelphia in 1877 at the age of 22 and was the first of her family to have a diagnosis and the first to have an operation. She apparently had a double iridectomy performed and now at the age of 76 has some vision. (This individual has not as yet been examined by us since she lives in an inaccessible mountain district.) The one male of the third generation was drowned at 15 and at the time of his death had no eye symptoms.

*Fourth Generation.*—Two of the unaffected females in the third generation married, the first one having one glaucomatous male and the second having two glaucomatous males as their only issue, all three of whom maintained useful vision following some operation. One affected and one unaffected female were not married and had no issue. The second affected female (the one diagnosed and operated on in Philadelphia) in the third generation had six children, four females and two males. Of these, two females were diagnosed as having glaucoma between 20 and 25 years of age, have had iridectomies on each eye and maintain useful vision. Two females and one male have had no symptoms of glaucoma. One male, whose first symptoms began at 19 years of age, had bilateral iridectomies done at the age of 22 and, because of continued failure of vision and pain, had double trephine operations done four years later; i. e., 1911.

*Fifth Generation.*—Among the members of the fourth generation, one glaucomatous female remains unmarried and one glaucomatous female is married but has no issue. One nonglaucomatous female has four children, the oldest of whom, aged 16 years, has characteristic symptoms from the family's standpoint but has not been examined. Another female married, had one child, now about 17 years old, by her first husband, and three children by a second husband (a distant cousin), none of whom have shown any symptoms observable by the family. One nonglaucomatous male is married but has no issue. The remaining member of the fourth generation, a glaucomatous male, is the father of five children, two males and three females. One female, aged 18, is unaffected; two

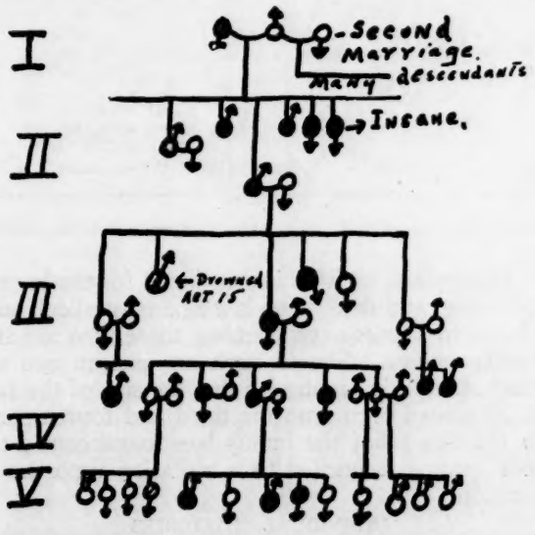


Fig. 1.—Genealogical tree of the family reported in this paper. In the pedigrees ♂ indicates male; ♀ female; the same characters in black indicate affected persons; the stippled characters, persons with amblyopia and doubtful glaucoma; cross-hatched, unknown or questionable. Generations are indicated by roman numerals.

males, aged 23 and 16 years, have glaucoma; one female, aged 15, has glaucoma; and the last, a child of 5 years, shows no symptoms as yet.

It is, of course, impossible to say with absolute certainty that the disease causing blindness in the first two generations was glaucoma, but it is highly probable, since the last three generations carefully observed by several ophthalmologists have shown identical symptoms, the course of the disease has been the same and is considered by the members of the third generation to be the same disease that caused blindness in their grandmother. In this connection a member of the family writes: "All the eye trouble in our family has been almost exactly alike."

A point of considerable interest in the record of this family lies in the fact that the original paternal genetor of this family of hereditary blindness remarried after the death of his first wife and from this union there were several children, among whose descendants carefully kept records show no mention of any ocular defect. This is poignantly suggestive of the famous Jukes family in the annals of criminology.

The intelligence of the family under consideration would easily be considered well above the average, if not superior; yet one is inclined to wonder why they have continued to breed large families in the face of a recognizable hereditary disease. This is explainable through the theological training of the five generations.

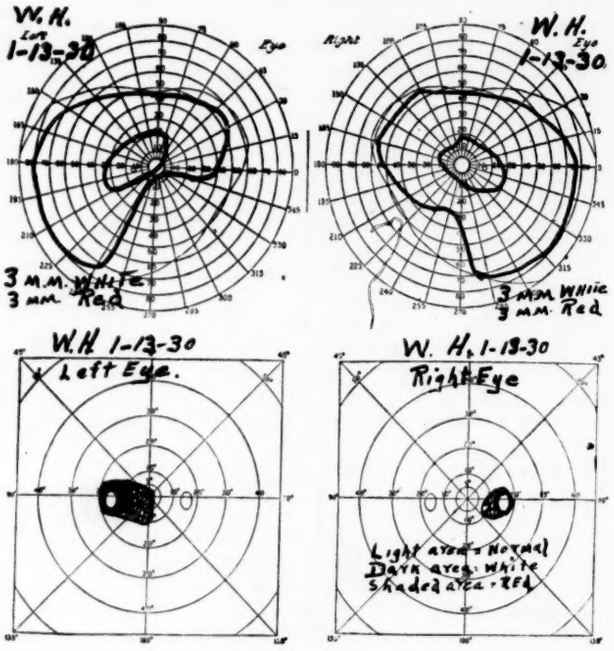


Fig. 2 (case 2).—Visual fields taken at time of first examination.

In the first place, wedlock is sanctioned for the begetting of offspring, and there is no law against wedlock among the Laws of Moses except among those who are at the moment unclean. Should such an unclean one enter wedlock, then it is prophesied that the sins of the father shall be visited even unto the third and fourth generation. In this belief the family has found comfort and cannot become reconciled to a visitation unto the fifth generation.

## INDIVIDUAL HISTORIES

CASE 1.—J. W., a man, aged 45, a member of the fourth generation, submitted to examination through courtesy. He stated that he had first noticed some failure of vision at the age of 19 and three years later bilateral iridectomies were performed. Because of continued failure of vision, another surgeon did bilateral trephine operations four years later. He was last examined, March 22, 1931. Vision in the right eye was reduced to perception of hand movements, and vision in the left to about 5/200 eccentric in the temporal field. The right cornea measured 11 mm. in both meridians and there was a dense scar in the posterior layers of the cornea which the patient stated had been present since the iridectomy on that eye. The left cornea measured the same and was clear. The anterior chambers were of normal depth. The irides, bluish gray, showed wide colobomas apparently extending to the roots. The disks were deeply cupped and atrophic.

CASE 2.—W. H., a youth, aged 15, was brought to us for an opinion in regard to the choice of operation for glaucoma, Jan. 13, 1930. Three months previously he had noticed some failure of vision in the left eye and more recently some failure of the right eye. An operation for glaucoma had already been advised and the father was concerned about the type of operation to be performed. The surgeon having care of the case preferred an Elliot trephine, but the father was convinced that an iridectomy was the operation of choice because previous members of the family had done so well with this type of operation. At this time the patient had visual acuity in the right eye of 5/15 and in the left eye of 5/22. The refractive error amounted only to a little mixed astigmatism without cycloplegia, and correction did not improve the vision. The visual fields showed a rather marked limitation for form and red, down and nasalward, this defect practically reaching fixation in the left eye. The blind spots were enlarged for form and much so for red (fig 2). The fundi showed typical glaucomatous cupping of the disks with some atrophy of each nerve. The tension in each eye was 42 mm. (Schiötz). The corneas measured 11 mm. in both the horizontal and vertical meridians; the anterior chambers were of normal depth, and no abnormality of the angle could be seen with the slit lamp; the irides were bluish gray and the pupil in ordinary sunlight measured 7 mm. The opinion was expressed that the Elliot trephine offered the best results. The patient returned, March 28, stating that he had had an operation elsewhere on the right eye, February 1. It appeared that a trephine with a peripheral iridectomy had been done, but unfortunately the lens capsule must have been perforated because the lens was swollen and cataractous, the cornea steamy, the anterior chamber shallow and the tension greatly increased. At this time there was bare perception of light in the temporal field in the right eye. The vision in the left eye at this time was 5/22, with the form field contracted, nasally, to fixation (fig. 3). The patient was not seen for two and one-half months, i. e., June 18, at which time his father brought him to us for an operation on the left eye. At this time there was a slight amount of lens cortex remaining in the right eye, the vision was reduced to perception of hand movements in the temporal field, and the tension was 24 mm. (Schiötz). The vision in the left eye was now 5/30, the nasal contraction of the visual field had now overlapped the point of fixation as shown in the chart, and the tension was 40 mm. (Schiötz). On the same date a deep iridectomy beneath a conjunctival flap was performed (Reese method). Convalescence from this operation was uneventful except that the anterior chamber did not reform for four days. Six weeks later the remaining portion of the lens cortex in the right eye was needled and subsequently it all absorbed. During

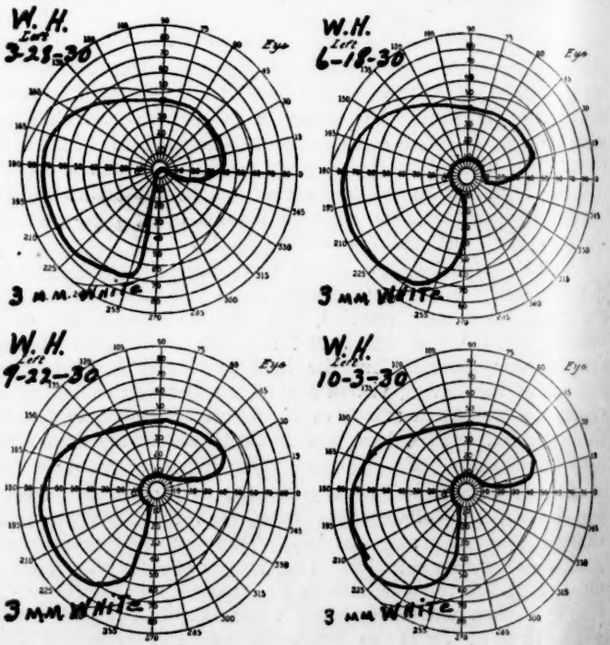


Fig. 3 (case 2).—Visual fields of left eye. Right field reduced to hand movements in temporal field. The chart, dated June 18, 1930, was taken at the time of operation on the left eye.

the past eight months there has been no change in either eye. The right eye now has a black pupil; vision is reduced to perception of hand movements in the temporal field, and the tension is normal. In the left eye, vision equals 5/30; the peripheral field remains as described previously, and the tension varies from 20 to 24 mm. (Schiötz).

CASE 3.—H. C., aged 23, a brother of W. H., M. F. and M. G., had been having failing vision for seven or eight

months. He had consulted numerous oculists who had advised tonsillectomy, extraction of teeth and the like but his vision had gradually grown worse. At the time of his first examination, Dec. 6, 1930, the right vision was 5/30, the left 5/60; the right field showed a contraction of the nasal field extending to about the 20 degree meridian, nasally, with a good temporal field in the right eye and practically complete loss of the nasal field in the left eye (fig. 4). Tension at this time, as measured by the Schiötz tonometer, was 60 mm. in each eye. Immediate operation was advised, but the patient did not return for one month. At this time the pupils were widely dilated; the vision in each eye was further reduced; there was distinct pulsation of the retinal arteries, and the tension was 60 plus in each eye (Schiötz). On the following day a double Lagrange operation was attempted; but since practically no sclera was cut away in the left eye the operation amounted practically to an iridectomy. Healing was prompt and two weeks later the tension in each eye was 35 (Schiötz); the field showed slightly more nasal contraction in each eye; but this patient has not been seen for four months (fig. 5).

CASE 4.—Miss F., aged 17, a sister of W. H., has no complaint and believes that she is safe from glaucoma because

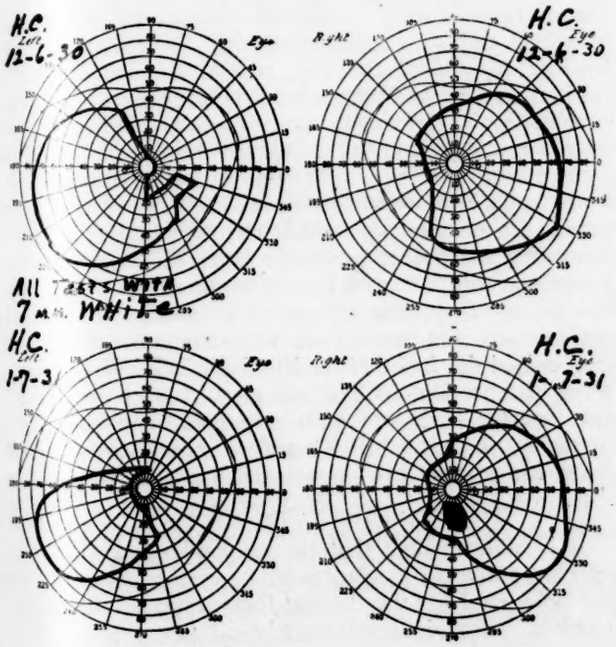


Fig. 4 (case 3).—Visual fields as charted at time of first examination and on day of operation. The fields two weeks later were practically the same.

she lacks the stigmas of gray eyes and large pupils. Vision in each eye is normal and only a slight amount of hyperopic astigmatism is elicited on manifest examination, in the right eye only. The corneas equal 11 mm. in both horizontal and vertical meridians; the anterior chambers are normal in depth, the irides are brownish gray and the disks rather deeply cupped but appear perfectly physiologic. The pupils measure 4 mm. Six drops of epinephrine (1:1,000) were instilled at five minute intervals and at the end of one hour the pupils still were 4 mm. Tension (digital) was normal.

CASE 5.—Miss G., aged 15, a sister of W. H. and Miss M. G., has no complaint but is examined because of the family history of glaucoma. The vision in each eye is 5/5 plus. The corneas measure 11 mm. in each meridian; the anterior chamber is of normal depth; the irides are very dark brown; the pupils in daylight measure 2 mm.; after six drops of epinephrine, the pupils in the same light measure 4 mm. At this examination there is a slight contraction of the nasal field in the left eye for form and a more marked contraction for red; there is a very definite enlargement of the left blind spot for form but this is accentuated for red; the tension of the right eye is 22, and of the left, 35 mm. (Schiötz) (fig. 6). Since the foregoing records of intra-ocular tension were taken following the instillation of epinephrine, the tension was again measured two days later, at which time the tension in the right eye was 30 and the left eye 43. Five days later the vision was still normal; there was no apparent change in the visual fields, but at this time the tension in each eye was 40 mm. Operation on each eye was advised but has not been done at the time of submission of this report.

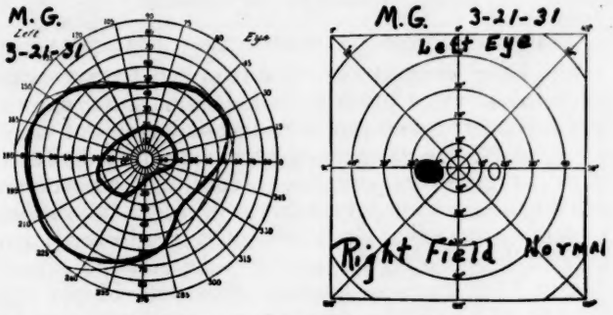


Fig. 5 (case 5).—Visual field of the left eye taken with 2 mm. white and 3 mm. red objects. Right field normal.

CASE 6.—J., aged 5 years, was examined because of the family history. Vision in the right eye was 5/6 and vision in the left, 5/10 (Illit). The corneas were 11 mm. in both meridians; pupils, 2 mm.; after six drops of epinephrine, the pupils were the same at the end of one hour; the fields were impossible.

### TYPE OF HEREDITARY GLAUCOMA

Macklin [9] considers glaucoma a dominant character which can be inherited. Kamenetsky [10] reported three generations of a family with chronic glaucoma and iris atrophy, in which only males were involved, through sound mothers. He regards this as an example of sex-limited inheritance of a recessive character. Most of the families recorded show no such limitation, both sexes being involved.

Löhlein [11] found, in a large compilation of cases from the literature, that 20 per cent of juvenile glaucoma shows a direct or collateral inheritance. Hirschberg [12] and Vossius [12] believed that glaucoma of middle and advanced age also shows a large degree of heredity. Löhlein thinks that a predisposition to glaucoma may

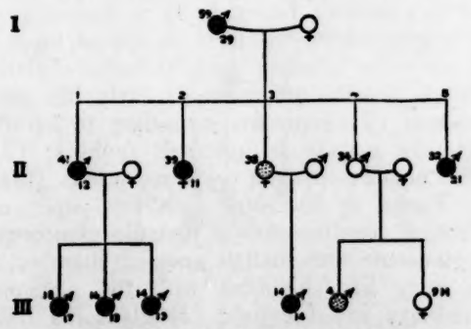


Fig. 6.—Pedigree of Calhoun's patient. The numbers above each individual indicate the present age; below, the age when bad sight was first detected.

be inherited. He quotes Schmidt-Rimpler's [13] statement that, to explain this heredity, one must assume an inherited local disposition (as rigidity of the sclera,

9. Macklin, M. T.: Hereditary Abnormalities of the Eye, Canad. M. A. J. **17**: 421 (April) 1927.
10. Kamenetsky, F.: Hereditary Glaucoma with Iris Atrophy, Zentralbl. f. d. ges. Ophth. **18**: 8 and 816, 1927; Klin. Monatsbl. f. Augenh. **74**: 133. 1925.
11. Löhlein, W.: Das Glaukom der Jugendlichen, Arch. f. Ophth. **85**: 393, 1913 (with excellent bibliography).
12. Cited by Löhlein (footnote 11).
13. Schmidt-Rimpler, H.: Graefe-Saemisch Handbuch **5**: 1, 1877.

irritability of secretory nerves, arteriosclerosis) or some cause lying in the general constitution which can lead, through the excitability of vasomotor centers and circulatory disturbances, to increase of intra-ocular tension.

Our family would seem to have glaucoma as a dominant character, one half of the descendants in five generations being attacked by the disease.

### CLASSIFICATION OF HEREDITARY GLAUCOMA

We have quoted von Graefe's belief that acute glaucoma is more often inherited than is the chronic type. Haag [14] found this to be true in a series of sixty-seven cases, the congestive type appearing twice as often as glaucoma simplex. Holland [15] reports six individuals in three generations in India, all having bilateral congestive glaucoma. On the other hand, Löhlein,[11] tabulating the reports in the literature, found that in 1,640 cases of juvenile glaucoma, 18 per cent were acute and 82 per cent chronic. In his own series of 140 eyes, 7 had glaucoma absolutum, 24 acute or subacute, and 109 had chronic glaucoma. Lawford [16] found the inherited cases usually of the chronic form.

Classification is difficult in such a subject. What age limit should be fixed for "juvenile" glaucoma? What

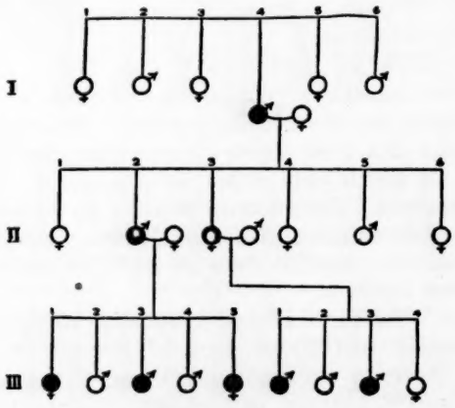


Fig. 7.—Pedigree of Howe's patient.

associated abnormalities may be disregarded and what accepted as causative factors? Is a glaucoma accompanying slight defects manifest in one or more structures of the eye a "primary" or a "secondary" glaucoma? Nettleship [17] divided glaucoma of early life into (1) buphthalmos; (2) glaucoma secondary to keratitis or sclerokeratitis, usually in inherited syphilis; (3) primary glaucoma in children or young adults (under 30 years). Fuchs, in discussing Löhlein's paper, offered the following classification of juvenile glaucoma: (1) chronic glaucoma with shallow anterior chamber, occurring in early life, identical with the glaucoma of age, hereditary and familial; (2) glaucoma following congenital anomalies, in the same class with hydrophthalmos, also hereditary and familial; (3) glaucoma with deep anterior chamber, in myopic eyes; (4) glaucoma with deep anterior chamber and fine keratic precipitates, secondary, but may be confused with the primary type because of the scarcity of keratic precipitates.

The third type of both Nettleship and Fuchs corresponds to that which is reported in our family history.

Löhlein [11] believes that there is a group of glaucomas occurring in the young, especially under 40 years, that differs in no way from the usual glaucoma but is different from the congenital and other youthful glaucomas which are due to disturbances of development and are not acquired conditions.

### ASSOCIATED CONDITIONS

Although cases of hereditary glaucoma appear in eyes entirely free from other visible defects, there are many cases in which there seems to be a relationship between the glaucoma and certain developmental faults. Coloboma of the nerve head is described with glaucoma (Müller-Kannberg,[18] Bäumler [19]). Schmidt-Rimpler [13] said that 50 per cent of juvenile glaucomas have a faulty Schlemm's canal. Löhlein [11] asked whether juvenile glaucoma may not be a form of buphthalmos in which the congenital anomaly of the chamber angle is not sufficient to produce a full blown buphthalmos. He found the following conditions present in his cases: persistent pupillary membrane with disturbance of the anterior capsule of the lens, partial lamellar cataract, coloboma of iris and lens, unusually large lens (anatomic examination), abnormally large cornea, staphyloma of sclera, microphthalmos, excessive hyperopia, retinitis pigmentosa, and nevus of the lid and conjunctiva. Veasey and Shumway [20] also found an abnormally large lens and a heavily pigmented iris, the anterior surface being like the normal posterior layer of this structure. Priestley Smith's [21] well known insistence on the larger lens of age is pertinent here. He found in two cases large lenses and small eyes with small corneas. He emphasized the fact that the lens is of ectodermal origin, being independent of the mesoderm, which begins its development later and ends it sooner, while the lens continues its growth. Therefore, the factors which make for a small eye do not check the growth of the lens.

### GLAUCOMA AND MYOPIA

It is quite evident that the preponderance of hyperopia over myopia in glaucomatous eyes in general does not hold good for the chronic form, especially in youth. Löhlein [11] found approximately 50 per cent of glaucomatous eyes in young people to be myopic, and about one third of these had myopia of more than 6 diopters. Haag [14] found only 20 per cent hyperopic (in sixty-seven cases). Nearly two thirds of Nettleship's [17] patients were myopic. He found that when myopia and glaucoma occurred together the glaucoma began very early in life in over half of the cases. He referred to the antagonism of both youth and myopia to glaucoma and asked the question whether myopia predisposes to glaucoma or both conditions follow some local cause. Van Graefe [8] had asked the same question, having observed that about one third of his cases of glaucoma simplex occurred in myopic eyes. In a later discussion of the subject (1906) Nettleship [22] said: "Although I think there is reason to believe that myopia in the child may to some extent take the place of glaucoma in the parent, the general enlargement of the sclerotic by no means always acts as an efficient

14. Haag, C.: Das Glaukom der Jugendlichen, Klin. Monatsbl. f. Augenh. **54**: 133, 1915.
15. Holland, H. T.: Hereditary Glaucoma Affecting Three Generations, Indian M. Gaz. **59**: 408 (Aug.) 1924.
16. Lawford, J. B.: Examples of Hereditary Primary Glaucoma, Royal London Ophth. Hosp. Rep. **17**: 57, 1908.
17. Nettleship, E.: Glaucoma in Early Life, Royal London Ophth. Hosp. Rep. **12**: 220, 1888.
18. Müller-Kannberg: Vererbung des Glaukom, Klin. Monatsbl. f. Augenh. **32**: 173, 1894.
19. Bäumler: Ueber Glaukom Adolescen, Klin. Monatsbl. f. Augenh., 1907, p. 445.
20. Veasey, C. A., and Shumway, E. A.: Simple Glaucoma in the Young, Ophth. Rec. **13**: 15, 1904.
21. Smith, Priestley: On an Instance of Hereditary Glaucoma, Ophth. Rev. **13**, 1894.
22. Nettleship, E.: Some Hereditary Diseases of the Eye, Ophthalmoscope **14**: 549, 1906.

safety valve, the disk being often excavated too, so that both myopia and glaucoma ensue." Löhlein [11] does not think that there is a glaucoma myopicum resulting from previous myopia but that, on the contrary, myopia may develop on the basis of a glaucoma, and possibly both can develop on a common hereditary basis.

Ischreyt [23] examined ten cases anatomically and found no definite relationship between the myopia and the

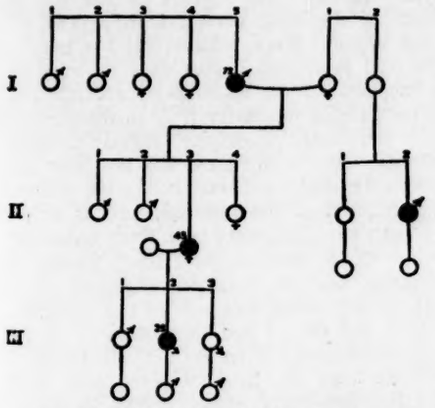

Fig. 8.—Pedigree of Nettleship's patient.

glaucoma. So far as we can discover, this is the most complete study of the subject.

There is, of course, a possibility of confusion in the interpretation of the excavation of the disk. In discussing Bäumler's [19] paper, Elsching stated that glaucomatous atrophy is essentially different from any other. Axenfeld, on the contrary, thought that myopia can give the same excavation as glaucoma. The late Dr. S. D. Risley insisted, as those who had the opportunity of following him in the Philadelphia clinics will recall, on a relationship between the two conditions. He believed myopia to be the result of stretching of the youthful eye owing to increased intra-ocular pressure, which in turn results from the congestion of the vascular coat accompanying the efforts of accommodation in astigmatic and hyperopic eyes.

Our cases of juvenile glaucoma were practically emmetropic, only one showing the least myopia (a weak mixed astigmatism, —.25 in one meridian).

### SEX, AGE AND RACE

Juvenile glaucoma seems to attack the two sexes about equally (Haag,[14] Lawford [16]). Löhlein found males to predominate slightly and thinks that the slightly greater tendency in males about corresponds to the greater tendency of males to myopia in youth. This is in contrast to the greater liability of women to glaucoma in middle and advanced life.

In Haag's [14] series of sixty-seven cases the ages varied from 6 to 35 years. Löhlein [11] found the highest percentage of cases occurring between 15 and 20 years of age (38.8 per cent), the next highest between 20 and 25 (21.3 per cent), while 1.3 per cent occurred under the age of 5 years. Thirty years was the limit of his "juvenile" group. Of course, it is likely that the onset was somewhat earlier than the patient or the family thought.

There seems to be no definite racial factor in these cases. The predisposition of the more nervous or unstable races to acute glaucoma seems not to hold for the juvenile disease, which is usually of the chronic type. Our cases come of a pure blooded Anglo-Saxon stock with no admixture of any other race for many generations.

23. Ischreyt, G.: Ueber die Beziehung zwischen Glaukom und Myopie, Arch. f. Augenh. **64**: 165, 1909.

### ANTICIPATION

The tendency of glaucoma to occur at an earlier age in succeeding generations has been mentioned. Von Graefe [8] called attention to this fact, and writers have generally substantiated this observation. Plocher,[24] Nettleship,[22] and Calhoun [25] noted it in their family histories, and it appears in many others recorded in the literature, though not always emphasized.

Our family does not show any marked anticipation. It is true that the first blind member was definitely handicapped by poor vision at the age of 30 years, the next generation somewhat younger, and the fifth as early as 15 years, in one case; but it is most likely that the succeeding generations were seen earlier and therefore a diagnosis was made earlier. This is true of the girl of 15, who had not complained and who considered her eyes perfectly good when brought by her father as a precautionary measure at our request.

### SIZE OF CORNEA AND LENS

The small cornea of the glaucomatous eye is well known. We have been much impressed by this observation in the glaucomas of middle and advanced life. Priestley Smith [21] commented on this, as already mentioned. Our juvenile patients had corneas of normal diameters.

We have had no opportunity for anatomic study of the crystalline lens, but Veasey and Shumway [20] found a very large lens in a myopic eye with juvenile glaucoma, and Priestley Smith has emphasized the size of the lens as a factor in glaucoma.

### PROGNOSIS AND TREATMENT

We find no evidence in the literature of favorable outcome to juvenile glaucomas without operation, and the results of operation are by no means certain. Germann [26] reported two out of four cases in a family,

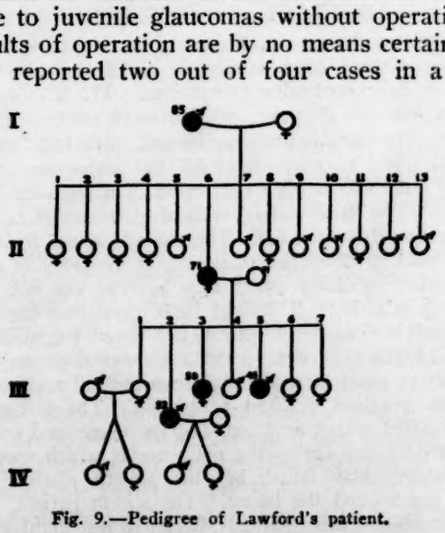

Fig. 9.—Pedigree of Lawford's patient.

checked by iridectomy. Priestley Smith's [21] report was very discouraging. Sattler [27] reported two cases checked by iridectomy. Nettleship [17] stated that in five cases seen early good results followed iridectomy. Calhoun [25] did thirteen operations on five patients (nine eyes). He

24. Plocher, R.: Beitrag zum juvenilen familiären Glaukom, Klin. Monatsbl. f. Augenh. **60**: 592, 1918.
25. Calhoun, F. P.: Hereditary Glaucoma (Simplex), J. A. M. A. **63**: 209 (July 18) 1914.
26. Germann, D.: Juvenile and Family Glaucoma, Klin. Monatsbl. f. Augenh. **95**, July, 1908.
27. Sattler, R.: Juvenile Glaucoma, Tr. Am. Ophth. Soc. **10**, part 3, p. 519, 1905.

thought that the results in early cases, which did not show optic atrophy, were very gratifying, while those with atrophy could be arrested in a measure. He thought that the trephine was superior to simple iridectomy, or sclerectomy with the iridectomy of LaGrange. Werner[28] believes that a fistulizing operation is superior to iridectomy.[29]

Our two cases, in one of which an iridectomy was performed twelve months ago, and in the other a LaGrange sclerectomy with iridectomy on the right eye and an iridectomy on the left six months ago, appear to be checked but without improvement of central vision or fields.

SUMMARY

1. It seems clear, both from a review of the literature and from a study of the family reported, that there is a definite type of glaucoma which is hereditary.

2. This type of glaucoma occurs usually in the second or third decade of life and is not accompanied by the recognized conditions occurring in glaucoma of later life; i. e., small corneas, shallow anterior chambers, ametropia and large lens; nor is it associated with other congenital defects, such as aniridia and colobomas.

3. It is probable that the glaucoma factor is dominant over the factor for normal eyes and follows the same hereditary laws as brown irides.

4. While the hereditary type of juvenile glaucoma logically falls into the classification of chronic glaucoma to distinguish it from the acute congestive type, it must be recognized that the disease in reality runs a rather rapid course and that early diagnosis and early surgical intervention are essential.

5. There is no definite evidence that the disease can be influenced by miotics or other hypotensive drugs.

501 East Franklin Street.

## ABSTRACT OF DISCUSSION

DR. EDWARD SHUMWAY, Philadelphia: I desire to place on record the history of a family in which juvenile glaucoma occurred in four successive generations. The first patient was a woman who at 20 years of age went entirely blind from glaucoma. No operation was performed. She had five children, three males and two females. All the males are still living, two with good vision after correction of a considerable degree of myopia. The third male developed glaucoma at an early age and is the fourth on the list. The second patient, a daughter of the first patient, developed glaucoma at 17 years of age. She was operated on sixty years ago but did not see after the operation. She is still living, both eyes showing advanced phthisis bulbi. The third patient, her sister, began to lose her sight at 13 years of age; iridectomy was done on each eye. Twenty-three years later the right eye showed a ciliary staphyloma with a vision of light perception. The left eye had a vision of 20/50 with correction, and the eyeground examination showed a deep cupping of the optic nerve, which was atrophic. Vision subsequently failed, but the patient retained sufficient sight to get around the house. The fourth patient, a brother of the second and third patients, began to lose sight at 14 years of age. In one year the right eye was blind. The left eye became affected and was operated on but both eyes became totally blind from glaucoma, and the right eye was removed thirty-two years ago. At present the left eye shows phthisis bulbi. The fifth patient, the daughter of the fourth patient, represents the third generation. Glaucomatous symptoms appeared when she was 15 years of age. Both optic nerves developed deep cupping and the tension became increased. Despite the use of miotics, vision gradually failed and the visual fields became contracted. Operation was refused and myopia developed. By the time she was 22 years of age she was totally blind and large ciliary staphylomas appeared. She came under my care one year ago, and because of the deformity and the discomfort occasioned by the large staphylomas she asked for double enucleation, which was performed. Microscopic sections of the posterior halves of the eyes show complete cupping and atrophy of the optic nerves. The sixth patient, the daughter of the fifth patient, representing the fourth generation, is now sixteen years of age. At 5 years of age she showed small central cups of the optic nerves, with hyperopic astigmatism and normal vision. Since I have had her under observation, during the past year, both nerves have shown deep and nearly complete cupping, but the visual fields are full and the tension tested by the Schiötz tonometer is 28 in the right and 25 in the left eye. She uses pilocarpine regularly, and, with Dr. de Schweinitz's advice, operation has not been proposed. All the patients developed the disease before the sixteenth year, and with the exception of the last one, who is only 16 now, all gradually lost their sight, with or without operation.

DR. JOHN O. MCREYNOLDS, Dallas, Texas: It has been my observation that the condition observed and presented in this article is not a frequent one in our country. The cases developing in the second and third decades of life have been exceedingly infrequent. They do actually occur, but the most frequent form that we have observed and which could be properly called hereditary glaucoma has developed in the first decade of life and has participated in the characteristics of buphthalmos. Of course congenital hydrophthalmos is a condition depending essentially on anatomic changes in the eye, whereas the other forms of glaucoma described by the authors may depend on various causes, as brought out so well by Drs. Magitot and Duke-Elder and others. I am impressed with the fact that a full explanation of many of these cases has not been found but that they depend on anatomic changes in the eyeball and on differences in the nervous system and on certain nutritional disturbances not clearly understood. I have in the Scientific Exhibit today a moving picture of a case that illustrates this type. This little girl is 5 years old. The mother, father, grandfather and aunt were all blind, probably from glaucoma. Both eyes have been operated on. She first had glaucoma and later she developed cataract. The removal of the lens has been helpful in improving the vision and in relieving the condition of glaucoma. Just in passing I would say, with reference to treatment, that these patients are entitled to the same well established plan of treatment to which other glaucomatous patients are entitled. They should have the benefit of medical treatment, and of those surgical measures found effective in nonhereditary glaucoma.

DR. J. W. JERVEY, Greenville, S. C.: From clinical observation, I have come to believe that there is an hereditary tendency in all forms of glaucoma. It is difficult to say what should be termed "juvenile." Some place the deadline at 40 years. Drs. Courtney and Hill intimate that 30 years is the age after which glaucoma ceases to be juvenile. They stress that this form of the disease lacks the usual concomitant anatomic variations of ordinary glaucoma, such for example as shallow anterior chamber, as well as certain congenital defects. As for myopia being a predisposing factor, it is easier for me to believe that a high intra-ocular tension with the elasticity of the youthful eyeball is of a certain potentiality in the production of myopia which may even prove compensatory of the high tension; while a stiff and rigid sclera would be an added factor in continuance or increase of the glaucoma. One thing appeals to me as certain, so far as experience and reasoning can teach me, and that is that if our present-day conception of the physiology of intra-ocular drainage is correct, then no ordinary iridectomy need be expected to reduce tension satisfactorily (save by the happy chance of an unexpectedly filtrating wound) in an eye with a deep anterior chamber and thereby a presumptively open canal of Schlemm. In such an eye additional and complementary drainage must be obtained by means of one of the fistulizing operations. This distinction as to the choice of operative procedure in glaucoma should always be borne in mind. Any departure from its consideration is illogical, and any good operative results following the ignoring of these mandatory conditions are purely accidental. I note that in one of the two

28. Werner, S.: Acta Ophth. 7: 162, 1929.
29. Further references may be found in Löhlein's paper, in Parson's Pathology of the Eye, 4: 1409, and in the exhaustive bibliography in A. Peters' recent monograph, Das Glaukom, which is part of the third edition of the Graefe-Saemisch Handbuch der Augenheilkunde, page 161.

operative cases reported by the authors a Lagrange sclerectomy was done. This was an eminently proper choice of procedure, and I rejoice with them that the result was satisfactory.

DR. MICHAEL GOLDENBURG, Chicago: The hereditary anatomic factor in juvenile glaucoma may be open to question, but one would hardly question the arrest or maldevelopment of the chamber angle in the buphthalmic type. Maldevelopments of other parts of the body admittedly have a tendency to present themselves in families; the degree of maldevelopment varies, depending probably on the stage of arrest. Therefore, it may be assumed that the picture presented in the chamber angle of the buphthalmic type may also be of various grades and may be so modified as to include cases extending into the so-called juvenile age limit, or beyond, in my opinion; although in a series of 105 patients operated on, whose cases I reported in 1927, only four were under 14 months of age, and none were between that and 30. The authors have almost limited their paper to the anatomic hereditary factor but have referred to gout as a factor historically. In a paper recently presented, I have been able to demonstrate in a small series of cases other factors, such as alterations in the capillaries consisting of an increase in permeability. Such endothelial instability may be inherited and is found associated with certain endocrine and autonomic disturbances as seen in angioneurotic edema, hayfever, asthma and migraine conditions, in which distinct alterations in the ionic equilibrium may take place, particularly in the potassium: calcium ratio and in the carbon dioxide combining power. It is my belief that, in addition to the inherited anatomic factors brought out by the authors, there is an inherited tissue sensitivity, as demonstrated in the increased capillary permeability, which may be secondary to or preceded by a chemical change in the body fluid. It is difficult to separate these two factors and it is impossible to state which is the more important or which takes precedence in the precipitation of symptoms. The development of symptoms of glaucoma would depend on the combination and grade of these two factors, although either one could by itself manifest such symptoms if the grade should be sufficiently marked. The type of case precipitated would depend on such combinations as the precipitant and the ability of the eye to reestablish the intra-ocular fluid equilibrium to the anatomic state.

DR. F. H. VERHOEFF, Boston: I recall two cases of juvenile glaucoma in which I examined the eyes microscopically. In each of these I found a defective filtration angle similar to that found in buphthalmos. In juvenile glaucoma the outflow is not completely cut off, at least at first, and therefore in early life there is not enough intra-ocular pressure to enlarge the globe, whereas in buphthalmos the pressure is sufficient to do this. There are different grades of buphthalmos—in the same patient one eye may be much larger than the other. So it seems to me that juvenile glaucoma and buphthalmos simply represent differences in degree of the same condition.

DR. EMORY HILL, Richmond, Va.: We were much interested in the question whether we really had five generations of glaucoma. We have two branches of a family, as shown in the pedigree, both of which have kept the most careful family records. A man in the first generation of which we have record married a woman who developed some disease that led gradually to blindness by the time she was 30. Of her descendants, seventeen out of thirty-four had glaucoma. After her death the husband married again. Among the descendants of the second wife, a somewhat larger family but with equally accurate records, there is no history of hereditary eye disease. We have summarized thus: This type of glaucoma appears in the second or third decade of life, not accompanied by organic conditions associated with glaucoma in old people; that is, there is not the shallow anterior chamber, the hyperopia or the unusually large lens, nor is the glaucoma associated with other congenital defects, such as coloboma. Clinically, the type we are reporting seems to be a different entity from buphthalmos. It may be a matter of degree, but practically all the cases occur later in life and the symptoms are different. In about 50 per cent of the cases of juvenile glaucoma in the literature, myopia is recorded. In none of our cases has there been appreciable ametropia so far as we could learn by refraction without cycloplegics. The hereditary type of juvenile glaucoma logically falls into the classification of chronic glaucoma, to distinguish it from the acute type. It runs, however, a rather rapid course. Early surgical intervention, we think, is indicated. We have found no record in the literature of miotics doing any good. The fact seems to be that succeeding generations take better care of their eyes and are seen earlier. For example, we have a girl, aged 15 years, in the fifth generation who did not complain of her eyes, but she had a perfectly definite glaucoma, and we have operated on her recently. We did an iridectomy in the second eye of the first patient because he had had a disastrous result from a trephine operation, and the father was unwilling to have anything done but iridectomy. In the second case we did a Lagrange operation in both eyes. I think Dr. Jervey's point is well taken that something more than a simple iridectomy should be done.

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# FOCAL INFECTION OF ANAL ORIGIN*

LOUIS J. HIRSCHMAN, M.D.
DETROIT

It is a well established fact that many symptoms which have been treated empirically by the administration of sedatives, analgesics, massage, various types of heliotherapy, electrotherapy and other types of physical therapy are merely the manifestations of infection located in organs more or less remote from the point at which these symptoms are made manifest.

For many years we physicians were in the habit of speaking more or less perfunctorily of attacks of "biliousness," "indigestion," "dyspepsia," "rheumatism," "neuritis," "arthritis," "autointoxication," and "reflex pains," with some variations or ramifications of these conditions. We used to speak of, think of, and treat many patients for so-called muscular rheumatism, sciatica, lumbago and various neuralgias. We can all remember many instances in which internal organs were innocently accused of being the general causal factors, and we can all recall surgical operations for the removal of these organs, which have since proved unnecessary. Since we have learned that many symptoms of a more or less general type are due to infections originating in parts of the body usually remote from where these symptoms are most manifested, many of these organs have been examined and, in many instances, definite foci have been discovered from which these infections originated.

The teeth, the tonsils, the various sinuses, the gallbladder, appendix, prostate and kidney have all been found to contain definite primary infective processes the absorption of whose products has been responsible for many symptoms heretofore treated in a general way and somewhat haphazardly. The symptoms of intestinal indigestion and so-called autointoxication have long been known to the profession, and are usually treated by the administration of cathartics and enemas and the regulation of the patient's diet.

This has been good treatment in not a few of these patients, but in others only transitory amelioration of symptoms has taken place. Satisfactory relief of symptoms of a permanent character has not been accomplished. Symptoms such as neuralgia, muscular pains, dizziness, nausea, headaches, blurring of the eyes, tiredness and lack of ambition, undefined aches and pains, constipation, bad breath, loss of appetite, abdominal distress, rise of temperature at various times, certain skin eruptions, and insomnia with bad dreams may all be due to focal infection.

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*Read before the Section on Gastro-Enterology and Proctology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 10, 1931.

Other symptoms of a more grave character, such as those of spondylitis, osteomyelitis, pyonephritis, and abscesses located in various other organs, many of which terminate fatally, may also originate from a single focus in an organ, which has been overlooked in the search for the origin of the infection.

As already stated, the symptoms of autointoxication have been generally recognized as some disordered condition of the intestinal canal, and under proper therapy many cases have responded to treatment. What has not been generally recognized, however, is the fact that there is an area at the terminal portion of the intestinal tract that is a ripe and fertile source of focal infection.

I refer to the crypts of Morgagni, which are located at the junction of the anal canal and the rectum. These crypts normally secrete a thick mucus, which serves as a lubricant to the feces just before their extrusion from the anal canal. They vary from three to twelve in number and are recognized as openings in the mucous membrane, usually crowned by small papillae. When diseased, these crypts are red and the papillae are pinkish white, enlarged and elongated, sometimes polypoid.

On examination through the anoscope with a hook-shaped probe or with one with a right-angled end, one can readily identify these crypts. Often times, pus can be demonstrated in the crypts, and not infrequently a sinus or a blind internal fistula will be found leading from a diseased crypt. These sinuses will vary in length from one-half inch to 2 inches (1 to 5 cm.) and extend usually in a radial direction from the crypts.

The crypts are large and more numerous and of greater capacity than tonsillar crypts. They infrequently cause any local symptoms; but when they do, the symptoms are quite characteristic. On account of the openings or mouths of the crypts being directed upward in a direction opposed to the fecal current, it is easy to see how irritating particles, such as bran, bits of bone, egg-shell, oyster shell, vegetable seeds and skins, toothbrush bristles and other bits of foreign material are forced into the crypts during the expulsion of fecal matter.

When material such as this becomes lodged in a crypt, it acts as a foreign body and irritant and causes ulceration followed by suppuration and absorption. It is with difficulty that any of these particles are dislodged, and they usually remain and either disintegrate or irritate the crypts and traumatize them, as has been mentioned. What a fertile source of infection there is in this natural incubator! Anal cryptitis is probably the most frequently overlooked source of focal infection that is present in the human body today.

It is a very simple matter to include in the examination of the patient the anoscopic examination previously mentioned. The proctologist who indulges in this as a routine will be rewarded by not infrequently being the first to discover that an anal cryptitis or a perianal sinus is a source of infection that has produced symptoms such as are illustrated by some of the cases which I will here briefly report.

Case 1.—Mrs. J. V. B., aged 23, had a complete tear following the birth of her child two years previously, requiring a perineorrhaphy. She had had considerable irritation in the rectum and some mucopurulent discharge. She stated that she was operated on by a doctor for hemorrhoids, but the discharge returned after the operation and she then consulted an irregular advertising sanatorium guaranteeing "a cure of all diseases of the rectum without operation or hospital confinement or the use of anesthesia." She treated with this concern for several months and not only felt no improvement but noticed that she was getting worse. For several months she noticed that she had so-called rheumatic pains in the legs and left arm but did not associate these with the rectal condition. She consulted me for the relief of the rectal condition, and examination disclosed five ulcerated crypts and a small rectovaginal fistula. The rectovaginal fistula was repaired under caudal anesthesia and at the same time these ulcerated crypts were incised and drained.

Three months after the operation, which was successful in disposing of the rectovaginal fistula, anal irritation and discharge, the patient volunteered the information that she had gained 32 pounds (14.5 Kg.) and that the pains in the arm and in both limbs had entirely disappeared.

Case 2.—Mrs. W., aged 40, was decidedly neurotic. She suffered from insomnia, indigestion, intercostal pain, and so-called muscular rheumatism of the arms and legs. She had frequent attacks of dizziness, sometimes accompanied with nausea, and was inclined to be very despondent. Her tonsils were normal, as were her teeth. She had some headaches which suggested to her physician the possibility of sinus infection. Both roentgen examination and transillumination failed to disclose any pathologic condition in the sinus. She consulted me for the treatment of what she thought was intestinal indigestion. The anoscope revealed several infected crypts surmounted by large fibrous papillae. Excision of these under local anesthesia was accompanied by a startling change in the woman's whole condition as well as in her outlook on life. Her husband has informed me that his wife is a different woman, and it seems almost incredible to him that such an operation, so easily performed, could work such a marked change.

Case 3.—Dr. H. suffered from high blood pressure and an arthritis, involving particularly the right hand, for a number of years. He had had dental attention, and the tonsils had been removed as possible foci of infection, without much relief. He consulted me on account of a burning sensation in the region of the anus. Anoscopic examination disclosed an infected crypt in the left anterior quadrant into which a small abscess, beyond the margin, was draining. Pus could be expressed from this on slight pressure. This was opened under local anesthesia, and within forty-eight hours the patient was able to close his hand with comfort, something he had not been able to do for two years previously. Recovery was prompt and satisfactory, and all symptoms of arthritis have disappeared.

Case 4.—Mrs. H., aged 29, had been a semi-invalid for about a year. Headaches, evening elevation of temperature and gastro-intestinal distress date back to the time when she had an ischiorectal abscess opened by her family physician, a year before. This had apparently healed, but she still noticed pus appearing from the rectum with the stool. Examination disclosed an internal sinus opening into the left posterolateral quadrant. Stereoscopic roentgenograms, after injection with bismuth, showed a sinus 4 inches (10 cm.) in extent. This was opened radically under local anesthesia. With the healing of the wound, all the symptoms disappeared.

Case 5.—Dr. X, a busy specialist who, while advising others to recreate, to pursue diversion and to diet carefully, does none of these things himself, noticed that he appeared to be slowing up mentally as well as physically. He had sleepless nights; the bowels were somewhat constipated and he complained of urinary disturbance, loss of appetite, and dizziness. He noticed the appearance of an erythematous eruption at various places on his body. He experienced some relief from all the symptoms after alkaline enemas and saline cathartics. He had his tonsils removed and sinuses examined, with negative results. He consulted me for examination and treatment for hemorrhoids, which he knew he had. Examination demonstrated the presence of chronic internal hemorrhoids and also two deep infected morgagnian crypts. The surrounding mucous membrane was congested and angry red, and secretion could be demonstrated in the crypts. Excision of the crypts under local anesthesia soon removed all the symptoms.

Case 6.—Mr. M., aged 29, complained of recurrent attacks of appendicitis and pain in the region of the coccyx. He had been operated on by another surgeon for the removal of his appendix five months before. At that time, he asked the surgeon to investigate the condition of his coccyx, as he had been having trouble with it for several years. Roentgenograms were

made, which demonstrated some deviation to the left but no bone change. Nothing was done to the coccyx at the time of the appendix operation, and the confinement to bed incident to this aggravated the coccygeal symptoms.

He was referred to me on account of the trouble with the coccyx. Examination revealed marked anal crypt infection of long standing. The coccyx appeared normal, but the slightest movement or pressure of the sacrococcygeal joint caused intense pain. There was no evidence of arthritis anywhere else. A diagnosis of sacrococcygeal arthritis was made, and the anal crypts were believed to be the foci of infection. These were excised under local anesthesia and the arthritis quickly disappeared. In this case, the excision of the coccyx was seriously considered by both the patient and the other surgeon whom he had consulted, but the excision of the crypts removed the source of infection and cured the condition.

I believe a little more attention to and study of this symptom called "coccygodynia" will illustrate the fact that it is often caused by a true arthritis of the sacrococcygeal joint, and many cases in which the coccyx has been removed for the relief of this symptom might have been entirely relieved by the removal of the focus of infection, which, as has been demonstrated in the patients cited and in others, was located in a diseased and infected anal crypt.

CASE 7.—Mr. T., aged 42, an executive of a large manufacturing concern, had been troubled with pain over his right eye for the last two years, for which he had been treated by physicians, osteopaths and anybody who would offer him relief. He had had sinus treatment, and both tonsils had been removed, without relief. On account of some rectal irritation, he was referred to me for examination and treatment. Marked cryptitis with accompanying polypoid enlargement of the papillae was discovered. The removal of the crypts and papillae under local anesthesia was accompanied by the first relief from the neuralgic pains that the patient had received in two years. It is now a year since his operation, and he has had no return of his symptoms up to the present time.

One could go on indefinitely reporting cases of this type, but it is not necessary. There is no question that there are many patients suffering from symptoms of focal infection, who, after some of the foci are removed, have an apparent recurrence of symptoms after a period of temporary relief. These patients should have a careful investigation of the intestinal tract. The relief of crypt infection will cure these cases. There are many others, however, in which there are two and more focal sites, which must all be taken into account when considering remedial measures necessary for the relief of the patient's symptoms.

Quite frequently patients have been seen with bad teeth, infected tonsils and infected crypts. There have been others, however, who have submitted to a tonsillectomy, extraction of teeth with apical abscesses, and who have also submitted to the removal of an innocent appendix, all in the hope of removing the infective focus.

Imagine the disgust of the patient when symptoms, relieved for a while, return only to be permanently banished by a comparatively minor operation on the anus under local anesthesia. It is sincerely hoped that indiscriminate removal of anal papillae and morgagnian crypts discovered on anoscopic examination will not be indulged in by enthusiastic investigators.

This is the sad sequel of the evidence of an unsuspected organ being the focus of infection. I beg, however, that all patients suffering from symptoms such as I have mentioned should be at least given an anorectal examination to exclude, if possible, all foci of infection in the terminal portion of the intestinal canal.

The operative procedure for the removal of infected crypts and papillae is so simple under local anesthesia that it can be carried out without special training in proctology by any one who is accustomed to doing surgical work under local anesthesia.

The preparation for the operation is as follows: The patient is given a sodium bicarbonate enema the night before operation and again the following morning. If he is of a nervous disposition, a preliminary hypodermic of morphine sulphate, one-fourth grain (16 mg.) and scopolamine hydrobromide, one-hundredth grain (0.6 mg.), is administered. He is placed on the operating table in the left Sims position, and the skin surfaces around the anus are washed with alcohol followed with a 4 per cent solution of mercurochrome-220 soluble. The anesthetic solution used is 0.5 per cent nupercaine or procaine. A large hypodermic syringe is filled with this solution, and the sphincter is anesthetized by blocking the lesser sphincteric nerves through a puncture one-half inch behind the posterior commissure. The hypodermic needle used is sharp, flexible and of fine caliber so that it can be curved easily. After the sphincteric nerves are blocked, the injection is carried completely around the anal circumference, the solution being kept underneath the skin.

In two or three minutes the sphincter is completely relaxed, the anal canal and also the rectum can be completely exposed by eversion by traction with triangular forceps, which are placed on the skin margin at the four points of the compass. This brings the infected crypts and papillae into view. The papillae and crypts are then excised with curved scissors. These incisions are made in a direction parallel to the radiating folds, so that the scars resulting run in the direction of the anal folds, or in the long axis of the anal canal.

A wire probe bent at a right angle, if inserted into the mouth of a crypt, will render the excision very easy. After the crypts and papillae are removed, a compression dressing is applied and held in place by a T bandage. Bleeding sufficient to require ligature is rarely encountered. The patient can be up and around as soon after the operation as he desires; it is never necessary to confine him to bed for longer than a day or so.

Liquid petrolatum is administered in 1 or 2 ounce doses every night, and the patient is placed on a soft diet. There is no objection to daily evacuation. The only after-care required is the regulation of the patient's diet and bowels, with such local application to the healing surfaces as may be required in the individual case.

Any other anorectal operation for which indications are found, such as removal of polyps, hemorrhoids, fistulas and small fissures, can be performed under the same anesthesia at the same time.

There is one thing to be said about the excision of anal crypts for the relief of focal infection. No organ is removed and no damage of any kind is done to the patient or his physical welfare by the operation. This cannot be said of operations on any other foci, such as teeth, sinuses, tonsils or the abdominal organs.

As it has been demonstrated that focal infection does originate in this part of the body, whether there are other foci or not, the patient should be given the benefit of this information, and the removal of diseased crypts carried out as previously indicated. The gratitude of patients relieved after this procedure, particularly those who have undergone various other treatments without having secured that relief, will amply reward the practitioner of medicine who will follow this method.

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# RECTAL AND ANAL INJURIES FROM CERTAIN FOODS AND INGESTED FOREIGN BODIES *

DESCUM C. McKENNEY, M.D.
BUFFALO

Injuries to the lower part of the rectum and to the anal canal from certain foods and from foreign bodies, especially small ones ingested with food, are of sufficiently frequent occurrence to merit consideration. I shall not attempt a review of the literature to show all such articles that have been found but shall rather try to show the seriousness of the damage done and the course of the resulting infection.

One wonders how some of the articles found could possibly have escaped detection during mastication. Their presence is made known when such a body is hard, comes between the teeth, or impinges on the sensitive lining of the mouth. In this way many such articles are discovered and extruded before harm is done, yet many are swallowed unconsciously or, perhaps, consciously when too far down to be returned to the mouth.

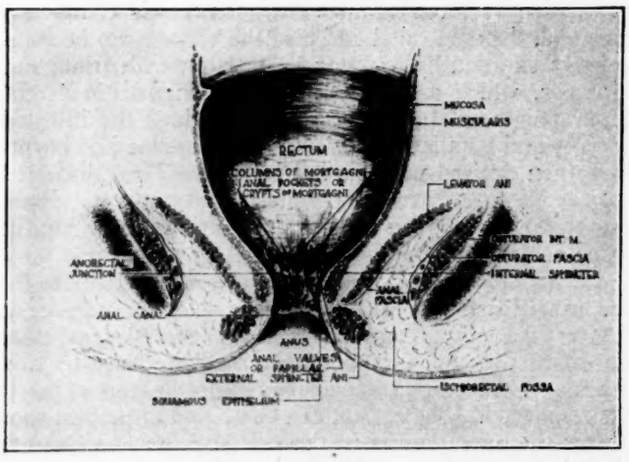


Fig. 1.—Anatomic features of the lower rectum, anal canal and anorectal junction predisposing to injury and infection.

A knowledge of the sensation of the upper part of the digestive tract will help in the understanding of such accidents. Sensation is marked in the tip of the tongue, the anterior part of the roof of the mouth and the pharynx down to the cricoid cartilage. This sensation protects the patient to a great extent. The esophagus is insensitive to touch, heat or cold until its lower end is reached. It is, however, sensitive to distention, which is a muscle sense, but seldom does any object, large enough to cause distention before reaching the lower end, get into the esophagus.

When dentures are used, the sensitive areas around the gums and the roof of the mouth are covered, so foreign bodies are not felt. Sometimes dentures are so uncomfortable that the wearer, to prevent pain, voluntarily avoids thorough mastication and so swallows the food unprepared. Incomplete and hurried mastication tends to permit the unconscious ingestion of foreign bodies; and, where teeth are missing, foreign bodies, by not falling between opposing teeth, escape detection.

Foods containing seeds, such as huckleberry, fig, raspberry, gooseberry, loganberry, strawberry, elderberry, thimbleberry, caraway, tomato and cucumber, are part of everyday diet. Seeds of the apple, grape, watermelon and orange are less frequently swallowed. Many people eat the cores of apples and some even parts of the stems.

It is not unusual to obtain a history that, during mastication, pieces of oyster shell, sand, nut and egg shells, and even perhaps small pieces of glass are crushed between the teeth and sometimes knowingly swallowed, the eater thinking that they are small and will do no harm; or perhaps, when at the table with others, the person swallows them to avoid the embarrassment of leaving the table or removing them from the mouth.

Corn on the cob, especially when overripe, popcorn, poppy seeds and nuts, particularly peanuts, are injurious, either as small hard particles or as a mass when eaten in quantities.

Recently a company established a chain of brilliantly illuminated and attractive popcorn stands throughout our city. Heralding them as an adjunct to proctology, I have not been disappointed.

Small fruit stones, such as that of the olive, cherry, plum and peach, as well as pieces of gristle are at times accidentally swallowed. These are prone to form the nucleus of a fecal impaction or enterolith.

Splinters of wood and pieces of bone, such as the bones of chicken, fish and mammals (the latter broken into small bits when meats are chopped or sawn by the butcher) are also accidentally swallowed. Very small children, when creeping on the floor, pick up and swallow all kinds of articles, such as tacks, marbles, pins, needles and pebbles. Larger children at play carry toys and small articles in their mouths and accidentally swallow them during exertion. Toothpicks are swallowed by those who have the habit of chewing them. Toothbrush bristles and chips from glass fruit jars, enamel ware and nickel-plated ware, pieces of the fingernails of fingernail biters, tacks, nails and pins furnish additional foreign bodies. A small hardened collection of feces may form in an anal pocket and act as a foreign body.

The articles just mentioned are small and, fortunately, most of them, being surrounded by feces, go through the intestinal tract and are evacuated without doing any harm. Some cause injury, which may or may not be followed by infection, and pass on. Still others become lodged during their passage, cause injury and ulceration, remain for a time, and then, in the purulent discharge which forms, are extruded, so that when the patient is examined only the damage done by the foreign body is found. Not all foreign bodies, however, after doing harm, are evacuated. I have found in situ a considerable number known to be the injuring agent. Clinical proof locates the origin of about 85 to 90 per cent of the lesions due to infection in the lower part of the rectum and in the anal canal near the anorectal junction. These facts emphasize the importance of small foreign bodies in the study of the etiology of rectal and anal conditions characterized by infection. The likelihood of foreign bodies being caught in the tissues and remaining as evidence of the damage they do is admittedly slight, but in view of the number found in lesions it must be conceded, first, that an innumerable number must pass through the intestinal tract harmlessly, and, secondly, that a considerable number may do damage without being discovered.

To understand why injury does take place most often at or near the anorectal junction, it is necessary to

* Read before the Section on Gastro-Enterology and Proctology at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June [illegible] 1931.

review briefly the embryology. According to Pennington's description, the hindgut in embryonic life, lined with mucosa, later becomes the rectum. It is about four times the diameter of the proctodeum, which is lined with squamous epithelium and later becomes the anal canal. For the hindgut to unite with the narrower proctodeum, it has to be puckered and thrown into folds. These infolds are known as the columns of Morgagni. Owing to the difference in the caliber of the two tubes, the line of junction necessarily had to be uneven and irregular, forming from six to twelve saw-tooth-like projections into the canal, the anal valves or papillae, which join the lower ends of the columns and thus form the anal pockets or crypts above them. These pockets are located in the lower part of the rectum or just in the beginning of the anal canal, which is, in reality, the anorectal junction (fig. 1). Thus it will be seen that the rectum forms the conical part of a funnel and the anal canal its neck. The anal canal is surrounded by powerful muscles, which have to be dilated when feces are forced through. The brunt of the force sufficient to effect that dilatation and the molding of the feces must necessarily be exerted at the beginning of the neck, where anal crypts stand open and ready to intercept foreign bodies with resulting injury (figs. 1 and 2).

As circulatory disturbances later in adult life cause a coalescence of several of the columns of Morgagni to form a single hemorrhoidal tumor, obliteration of the pockets corresponding to these columns also takes place. Three or four, rarely five, internal hemorrhoids are thus formed. The remaining pockets correspond to the space between the hemorrhoids and hence are larger and deeper. There are usually about five main ones, two posteriorly, one anteriorly, one right and another left posteriorly. These crypts thus become

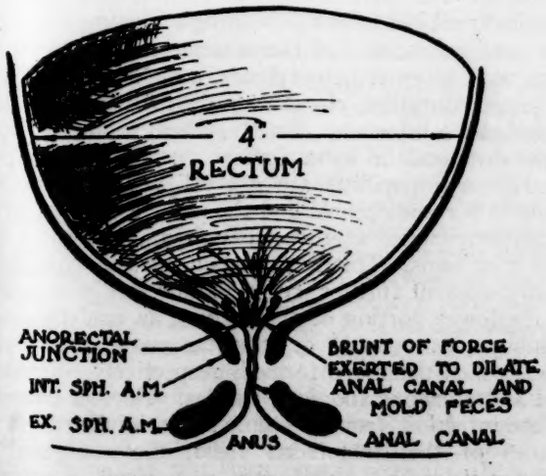


Fig. 2.—Mechanical cause of injury and infection at the anorectal junction.

veritable "catchalls," so frequently referred to in the literature. As the hemorrhoids increase in size, the pockets likewise become larger and deeper, and the larger they are the more vulnerable.

Cathartics and enemas liquefy stools and increase the force of their passage. Weariness relaxes the sphincter muscles, thus opening the pockets more widely and permitting foreign bodies more readily to catch in them.

Should a sharp foreign body become embedded in the outside of a hard formed stool, it is apt to scratch or cut the lining when it is passing along the constricted parts of the bowel, especially the lower part of the rectum and the anal canal. On the other hand, in cases of diarrhea the foreign body floating free in a fluid stool does not receive any protection from the feces; the expulsive force is great, and the external sphincter is in spasm because of the irritation of many fluid evacuations; hence injury is very apt to occur. Soft mass feces are the most effectual carrier of foreign bodies in the prevention of injury, because they more

Fig. 3.—*A*, anal crypt or pocket; *B*, ulcerated area of pocket; *C*, squamous epithelium lining pocket; *D*, foci of perivascular infiltration.

nearly approach the normal for man and are nonirritating in their passage; they favor normal and comfortable relaxation of the external sphincter; they do not hold the foreign body firmly at their circumference during passage, as does the hard formed stool, but permit it to be pushed into the mass, should they encounter slight resistance, and yet give a maximum of favorable support.

The symptoms of injury by a foreign body which is at once evacuated are those of a stabbing, cutting or pricking pain, which lasts only a minute or two, with sometimes a little bright blood, followed by soreness, ordinarily of short duration. This is the most common history, and usually it ends there. The injury may have happened so far in the past, or even have been so slight, that it was forgotten or no attention paid to it. My contention is that there are many such accidents.

If infection follows soon after the injury and is progressive, then the symptoms become continuous, merging into those of the resulting condition cryptitis (fig. 3), ulcer, fissure, sinus, abscess or fistula. A carefully taken history in such cases will frequently, however, establish the date of a former injury as days, months or perhaps years before, since which time there have been periods of comparative comfort, indicating partial healing, followed by exacerbations due to additional irritation, until finally an attack was severe enough to send the patient to the physician. The physician then finds, in addition to the acute condition, one of the many evidences of former trouble or chronicity, such as a hypertrophied anal valve, deep crypt with sinus, fistula, stricture, or scar of an old fissure.

If the foreign body lodges and stays in place, the pain has a sudden onset, often intense and continuous,

or it may subside until the passage of the next hard stool, when it is made worse. Sometimes the patient himself with his finger is able to dislodge the offender, but generally a physician has to come to his aid. If it is not removed, it may penetrate the bowel wall, form an abscess in the deeper tissues, and be followed by a sinus or fistula. A foreign body, like a sliver of bone or nail, when over 3 cm. in length is very apt to get one end caught in a pocket and, by pressure of the feces from above, have the other end forced against the opposite side, puncturing the bowel in two places. I had one such case in which two ischiorectal abscesses were formed and later two anorectal fistulas.

Some of the ingested foreign bodies which I have removed from lesions in the lower rectum or anal canal are:

Pieces of apple core.
Fish bones.
Splinters of bone.
Chicken ribs.
Seeds: poppy, psyllium, caraway, fig, tomato, cucumber, apple, grape (great quantity in one patient).
Splinters of wood.
Pieces of wooden toothpicks.
Toothbrush bristles.
Hardened feces.
Pieces of egg shell.
Piece of lobster shell.
Fish scale.
Pieces of enamel from granite ware.
Pieces of plating from a table knife.
Child's beauty pin.
Pieces of fingernail.
Peach stone splinter.
Piece of glass.
Husk of oat grain.
Piece of bone, resulting from necrosis of the patient's own sacrum.

The lesions in which the foreign bodies mentioned were found in frequency of occurrence, are:

Anal pockets or crypts.
Sinuses.
Fissures or ulcers.
Abscesses.
Fistulas.
Stricture.

The objects that were found free in the lower rectum were:

A penny.
Safety pin.
Peach stone.
Gallstones.
Pieces of gristle.
Impacted feces.

It is quite possible that in some instances the foreign body which caused the original injury escaped and that the one found was a secondary invader.

The most common offender is a piece of apple core, which, on account of its hardness and thin cutting edge, is easily caught in the lower part of the rectum and is prone to form a deep wound.

Next in my experience are pieces of bones. A fish bone was found 5 inches from the internal opening of a horseshoe fistula.

Third in frequency are small seeds, which are sometimes found in ulcers and sinuses and may easily be overlooked in the bottom of a crypt.

Then come splinters of wood, including pieces of toothpicks, toothbrush bristles, hardened feces and pieces of egg shell.

An apple seed, lodging in a posterior anal pocket, perforated the muscular coat above the levator ani muscle and formed an extraperitoneal pelvic abscess that could be palpated in the left groin above Poupart's ligament.

A patient complaining of a burning, throbbing pain, which had come on suddenly a week previously, was found to have in the anal canal a tender fluctuating tumor, which in the course of examination ruptured and discharged pus through an anal pocket. In the pus was discovered a slender object, 0.5 cm. long and pointed at both ends. The observation that the patient had bitten his fingernails half way to the base led to the identification of the foreign body as a piece of his own nail.

Rectal irritation occurs seasonally when people eat grapes, strawberries, raspberries and corn. In these cases the injury practically surrounds the lower portion of the rectum or the upper part of the anal canal and is complained of as soreness or a heavy, burning, bearing down feeling. The appearance is one of an early proctitis. A similar condition results from the continued use of quantities of psyllium seeds and bran for therapeutic purposes. Two cases of bran impaction were reported[1] in 1928, one of which reached a fatal termination because of perforation. A number of cases of rectal irritation from the use of bran, some with moderate impaction, have occurred in my practice. A normal individual is less apt to be disturbed by such articles of diet than one with internal hemorrhoids, a chronic cryptitis and papillitis, or who has very recently had a rectal operation.

From a neglected cryptitis as well as from the more generalized lower rectal irritation just mentioned, there may develop an inflammation of the rectum and pelvic colon, even going on to ulceration.

The clinical study of the pathology points to the region of the anal crypts as the starting point of practically all conditions depending on injury and infection; and on account of the association of these conditions with internal hemorrhoids, which necessarily are of longer duration, circulatory disturbance must have preceded the infection. Briefly, when, following injury either by food or by a foreign body, acute cryptitis (fig. 3) and papillitis are not relieved, the condition tends to become chronic and the picture changes to one of hypertrophied anal valve with an associated deep pocket or sinus. This is a constant menace, from which at any moment further irritation may lead to ulceration of the lower portion of the rectum, an anal fissure, or a submucous (rectal) or subcutaneous (anal) abscess from which there are formed, respectively, submucous and subcutaneous anorectal fistulas. Further extension of the infection, from the same source outward into the tissues of the ischiorectal fossa, the retro-anal triangular space or the perineum, may result in extensive abscess formation and later complicated fistulas. An anal fissure, when not acute and when examined for the first time, almost invariably has, at or near its upper end, a deep pocket with a more or less hypertrophied anal valve, and a tissue study shows continuous inflammation through pocket, valve and fissure.

Pennington has suggested a rational way of naming sinuses and fistulas from their internal openings; i. e., rectal, anorectal and anal. About 85 to 90 per cent of these passages open at the anorectal junction. When there is an opening into the rectum, the tract runs under

1. Butzke, E. J.; Barker, H. O.; Boswell, J. R., and Drewett, T. E.: Impaction of Bran in the Gastro-Intestinal Canal, U. S. Vet. Bur. M. Bull. 4: 549 (June) 1928.

the mucosa from the anorectal junction, where is located the original opening, which at the time may be patent or temporarily closed but apparent by the depth of the pocket. In my experience, a rectal fistula passing through the rectal muscular coat is comparatively rare and, when found, suggests the location of the original abscess above the levator ani, many of the lesions having their origin in an infected crypt.

In my experience, the careful examination of the anal fistula has shown the internal opening to be located at the lower end of a crypt torn down or destroyed by infection, or in an active fissure or in the scar of a healed one which is continuous with a crypt. Likewise, most rectal strictures are due to extension into the submucosa of infection of anorectal origin.

With this evidence of the etiologic factors and the starting point of so many serious rectal conditions, what can be done, if anything, to prevent them?

1. Prevent constipation, advising against the abuse of cathartics.
2. As soon as internal hemorrhoids form, treat them, either by the injection method, when small, or by surgical removal when they are of second or third degree.
3. Avoid excessive use of roughage and, when possible, the ingestion of foreign bodies.
4. When foreign bodies are found in situ, remove them and watch the wound until healed.
5. When an acutely inflamed crypt (fig. 3) is found, treat it, and when it is chronically inflamed, with or without a hypertrophied anal valve, excise it.
6. A patient with a known rectal pathologic condition should, if he will not have the process removed, be instructed to seek medical attention immediately, should there be a sudden pain, bleeding, or other evidence of acuteness.

416 Linwood Avenue.

## ABSTRACT OF DISCUSSION

### ON PAPERS OF DRS. HIRSCHMAN AND MCKENNEY

DR. CURTICE ROSSER, Dallas, Texas: There are certain principles which are of definite importance in the removal of foreign bodies, particularly because this type of case comes, usually, as an emergency in the practice of the average physician and it is well that certain fundamental concepts be established for that reason. I have previously stressed the importance of caudal and spinal anesthesia in the removal of large impacted foreign bodies as a method of obtaining complete relaxation of both anal sphincters and the muscular coats of the bowel. This device has made unnecessary many laparotomies and removals of the coccyx. It is no less important that first-aid intervention in small or large foreign bodies shall not be strenuous or meddlesome. Extremely careful digital exploration is permissible, but rough or continued attempts to remove the objects with the fingers are not only unavailing but may result in perforation of the bowel or in forcing the foreign body so high that laparotomy is necessary. It is suggested that the most sensible first-aid procedure is the administration of morphine to inhibit the antiperistalsis, which often carries the foreign body to the sigmoid. Another preliminary procedure, often of value, is an immediate roentgenogram to establish the fact of foreign body and reveal its location. Small foreign bodies are best removed through the proctoscope; infants and children are best anesthetized before being disturbed by any manipulation, after which they can be inverted and the foreign body removed, as in the case of adults, with alligator forceps. Dr. Hirschman, who has done as much as any other man living to dignify the study of rectal diseases and to call attention to the importance of lesions in this area previously regarded as of local interest only, may appear overenthusiastic concerning the influence of lesions in the anal canal in connection with constitutional disease. His enthusiasm will not be sufficient to counterbalance the almost complete disregard of the possibility of foci in this region which has characterized the search for primary causes of body infections. The usual statement, that the examination should eliminate foci in the teeth, tonsils, sinuses, appendix, prostate, etc., can be approved only if the "etc." is translated to mean "the anorectal region."

DR. FRANK C. YEOMANS, New York: When there is a definite history of the object swallowed, an expert in esophagoscopy and gastroscopy may frequently remove the object successfully from the esophagus or stomach. For objects casting a shadow or opaque to the rays, roentgenograms demonstrate their nature and location and, unless obstruction or other acute symptoms such as those of perforation occur, their downward progress may be observed. This is fortunate, as the large majority of small objects are passed. Thus, of thirty-one instances reported from the Presbyterian Hospital, New York, ten of twelve sharp objects were passed in from two days to three weeks, and fifteen of nineteen dull objects were passed in from one day to four weeks. On the roentgenogram, fruit pits show as vacuolations. The majority of foreign bodies that reach the colon and are not expelled spontaneously are arrested in the lower inch of the rectum. If sharp or rough and not removed promptly, they are prone to initiate in this situation the series of pathologic changes so clearly described by the author. In the case of objects beyond reach of the finger, sigmoidoscopy should never be omitted for the detection and possible removal of foreign bodies in the rectum proper or pelvic colon. The paper also sounds a timely note of warning against the excessive use of roughage so prevalent in the treatment of constipation. Excess frequently carries the desired physiologic stimulation to pathologic irritation.

DR. W. A. FANSLER, Minneapolis: Rectal crypts, while well known to proctologists, have been generally overlooked by the rest of the physicians. Dr. Hirschman has well covered the conditions which may arise from infected crypts. There is one point though about investigation of these crypts which I think is important; that is, they may be examined to the best advantage with a bivalve speculum. When the speculum is opened, the crypt is spread, the base is exposed, and it is possible to determine more accurately the amount of infection and inflammation that may exist. Because of pain it is not always possible to use the bivalve type of speculum, but when possible it is of considerable help. We have all had cases of various distant distress which disappeared following the eradication of infected crypts. Dr. Hirschman's word of warning about the indiscriminate removal of these crypts is timely but on the other hand in any obscure case they should not be overlooked as a possible cause of infection.

DR. JOHN L. JELKS, Memphis, Tenn.: I can report only two cases in which I removed foreign bodies. Evidently they are more prevalent where they have more fish than we have in Memphis. As to foci of infection, however, we have a large experience. Dr. Hirschman refers in one case, or in two, to the fact that he could not find a primary focus of infection higher up. I have never seen a case in which I could find a definite cryptitis in which there were not found amebas or pinworms, in which there was not foci of infection higher up. Those are definite observations with me. It is seldom sufficient to remove the infected crypts in these cases. There is usually an infection around the anus resulting from chronic infection which it is necessary for me to drain and get rid of the infection around the anus, which is the result of a chronic cryptitis. I have cleared up these cases of neuritis resulting from a chronic cryptitis which were primarily higher up and I told the patients they would not be permanently cured, and they were not, because the primary foci of infection were not cleared up higher up.

DR. ANTHONY BASSLER, New York: When one passes a protoscope into patient after patient, in almost all instances the mucous membrane of the rectum is clean. Occasionally one sees a bit or a mass of feces, but not often. There are people in whom there seemingly attach to the mucous membrane of the rectum particles of feces which remain there for a long time, and I know that most proctologists have seen instances of people in whom, when the rectoscope was passed, almost the entire lower end of the rectum was covered with feces. I have had the experience of observing several inches of rectal

wall plastered with feces before coming to an appearance of mucous membrane. An interesting thing with most of these people, not all of them, but most of them, is that they have toxic symptoms. I have no term for the condition. One may accept it as an infective condition of the mucous membrane from which there are toxic bodies that get into the circulation by way of resorption into the inferior hemorrhoidal veins. Not a few of these people have definite symptoms of some sort anywhere in the body. It is not an uncommon type of case, I am sure, and I merely want to mention it in connection with these various infective pathologic changes and to say that it has clinical significance as a producer of symptoms and that usually the patient is readily cured with a few enemas containing hydrogen dioxide.

DR. EMMETT H. TERRELL, Richmond, Va.: Both Dr. McKenney and Dr. Hirschman are proctologists and they can readily recognize this disease which they call cryptitis. Most of the physicians here, I take it, are gastro-enterologists, and probably the term "cryptitis" is not quite clear. Cryptitis occurs at the bottom of the little anal valves and may occur from the retention of seed or of fecal matter. This does not remain a simple cryptitis very long. After the infection exists there for a while, the valve becomes thickened and hypertrophied, which one recognizes as a papillitis. Soon the infection will pass beneath the mucocutaneous membrane, between it and a thin layer of fascia outside of it, producing what I term an anal sinusitis. An infection of this sort is frequently recognized when one is making a digital examination, being manifested by a marked spasm and irritability of the sphincter muscles.

DR. B. J. DRYFUSS, New York: I wish to say just a few words in regard to the etiology of this factor. One sees numbers of foreign bodies of all kinds, and today with the newspapers and magazines and radios all broadcasting the use of bran, psyllium seeds and colonic irrigations, it is a wonder that almost every one hasn't some sort of fecal infection. Any one who has done any amount of proctoscopic work, I am sure, will feel as I do, that these things, bran, psyllium seeds and roughage, which I am using in contradistinction to residue, work damage; and no one will be surprised to hear what Dr. Hirschman as well as Dr. McKenney said. I think it is a duty obligatory on us here as gastro-enterologists and proctologists and proctoscopists to start some sort of investigation to find out exactly the proportion and the value or lack of value of these irritants. Their pathologic results are evident to any one who has done any of that work and I feel sure it doesn't stop in cryptitis and proctitis but extends even further into carcinomatous conditions, diverticulitis and the rest, all of which have greatly increased in number in the last few years.

DR. DESCUM C. MCKENNEY, Buffalo: Regarding what has been said about the use of the anoscope and probe in making examinations, a sinus can easily be made by the latter when none is present, unless care is used. There will be less need for these instruments if one will first bimanually evert the anal canal, often thus exposing the anal pockets, showing signs of redness and inflammation, pus pouring from a pocket or even a sinus. One should follow this by palpation of the same region, which may reveal swelling or induration of the crypts. After this the instruments mentioned may be helpful in the diagnosis. There is no doubt that the upper part of the intestinal tract is responsible for a lot of anorectal trouble. I have seen, as Dr. Bassler has said, many times, dry particles of feces in the intestinal tract and have regarded it as abnormal but haven't quite understood what it was. I have thought it was an atrophic condition of the mucosa. Dr. Dryfuss has said what I tried to say, only said it so much better that I hope it will bear fruit, because I am sure, as I intimated, the use of bran and psyllium seeds is certainly doing a lot of harm. There was a question as to how to soften stools. I think the best thing of all is plain agar and liquid petrolatum used properly; and, when necessary to get the bowels to move, small cool enemas, given through a male catheter, as needed, are most helpful.

DR. LOUIS J. HIRSCHMAN, Detroit: I want to remark about the examination of the anus in order to disclose the presence of anal crypts. Dr. Fansler states that he has had better results in examining with a bivalve speculum. I use cylindric instruments. The first one used is about the size of the little finger, with an oblique opening, so that on withdrawing it one has a large field and sees two or three crypts in view but by dilating the anus, one doesn't get a second chance examination. I have seen patients with definite colonic dysfunctioning who have been entirely relieved when the focus and irritant were found in the first inch of the anal canal and were removed and the offending crypts drained. If we have done nothing more in these two papers than remind some of the men that there is a highly important area of focal infection here which is often originated by trauma such as mentioned in Dr. McKenney's paper, and we have reiterated that the examination of the anal canal is not only digital but must also include a visual examination, no matter what instrument one chooses to use, I think the papers have accomplished their purpose.

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# RECURRENT HYPERTHYROIDISM, NEUROCIRCULATORY ASTHENIA AND PEPTIC ULCER

## TREATMENT BY OPERATIONS ON THE SUPRARENAL-SYMPATHETIC SYSTEM *

GEORGE W. CRILE, M.D.
CLEVELAND

Civilized man has many diseases and infirmities in common with primitive man and the lower animals—accidents of birth, irregularities of adolescence and nutrition, cancer, infections and infectious diseases. On the other hand, there are certain diseases such as hyperthyroidism, neurocirculatory asthenia, peptic ulcer, diabetes and other less clearly defined diseases that are peculiarly the lot of civilized man. One should expect to find, then, that the mechanism the disturbance of which produces these diseases would be the mechanism on which civilized man's characteristics depend. The one characteristically human organ is the brain; the rise of the brain and its dominance has won for man his place in nature. It is characteristic of civilized man that his life is projected on rational lines, that it is full of work and worry as compared with that of the lower races of man and the lower animals.

One would expect, therefore, that hyperthyroidism, peptic ulcer, neurocirculatory asthenia, diabetes, and the like would be found most commonly among the most active, most striving, most worrying men and women. And this is a well known fact.

Now although the mechanism of the suprarenal-sympathetic-thyroid group was functioning before the dominant power of the brain was achieved, this frontal lobe has gained a certain amount of control over the suprarenal-sympathetic system. Certainly the expression of the emotions, the defense against infection, the heavy struggles of life are possible of execution only by the aid of the suprarenal-sympathetic-thyroid group. Since excessive worry and work, as well as infection, are common exciting causes of these diseases, one would expect that if the suprarenal-sympathetic system were to be separated from direct control of the brain there would be an abatement of the diseases mentioned as being bred in the drive of that mechanism. The most vulnerable point of attack would be the suprarenal link of the chain.

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* From the Cleveland Clinic.
* Read before the Section on Surgery, General and Abdominal, at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 12, 1931.

About nineteen years ago I tested the effect on these kinetic diseases of removing one suprarenal gland. The results gave promise but in some cases the good effects tended to wear off in time, just as in unilateral thyroidectomy for hyperthyroidism the clinical results are good at first, then tend to become less noticeable. In some cases thyroid resections and resections of the cervical sympathetic ganglions were added. After observing these cases long enough to find that this procedure had merit, my associates and I finally devised the operation of denervation of the suprarenal glands—first one, then the other—about a week apart.

From the foregoing considerations, one should expect that bilateral denervation of the suprarenal glands should sufficiently dissociate the suprarenal-sympathetic system from the organ of civilization—the frontal lobe—to effect a cure.

In selected cases of recurrent hyperthyroidism, cases in which there is often little thyroid remaining, we have divided the suprarenal nerves at intervals of a week or more with good results. Among these cases we have seen the entire exophthalmic goiter picture disappear after operation, including hyperplasia and increased metabolic rate.

Here is a new clinical fact of first importance, for it would seem that exophthalmic goiter is made up of fractions of pathologic physiology of a group of diseases including neurocirculatory asthenia, diabetes, myocardial disease and occasionally peptic ulcer.

If suprarenal denervation will cure this protean disease—hyperthyroidism—consisting of a number of fractions of diseases, then in the absence of an increased metabolic rate, if there is present one or more of these fractions, e. g., residual hyperthyroidism, neurocirculatory asthenia, diabetes, peptic ulcer, and the like, one would expect that suprarenal denervation would abate or possibly cure these fractions which form a part of the entire exophthalmic goiter syndrome.

We therefore logically employed the principle of dekineticizing this great system. We found that in neurocirculatory asthenia denervation of the suprarenal glands specifically abated or cured the disease, the results appearing as promptly and in about the same sequence as after thyroidectomy for exophthalmic goiter.

Neurocirculatory asthenia seems to be a milder form or an analogue of exophthalmic goiter, and, based on the results to date, denervation seems to be as specific a cure for neurocirculatory asthenia as thyroidectomy is for exophthalmic goiter.

We cannot yet speak with equal certainty as to the results of denervation in cases of peptic ulcer, but one point is certain; namely, that the symptoms are immediately relieved, and from analyses made by Dr. Lehman at the Cleveland Clinic, it has been found that the acidity has been reduced in all cases thus far studied.

Thus far we have performed 104 operations on the suprarenal-sympathetic system. My first unilateral suprarenalectomy among a series of forty-six was performed, Oct. 1, 1913—eighteen years ago.

At that time we held that in diseases due to excessive energy tranformation the drive of the so-called kinetic system could be diminished by partial thyroidectomy, by unilateral suprarenalectomy and by excision of the sympathetic ganglions. We soon realized, however, that the value of thyroidectomy was limited strictly to cases of hyperthyroidism, that both lobes had to be resected or recurrence would ensue, and that in this disease occasional recurrences were seen. The same principle of compensatory function was soon noted in unilateral suprarenalectomy. Better results were obtained by a general dekineticizing operation; namely, the removal of one suprarenal, resection of the thyroid, and the excision of the cervical ganglions at the time of the thyroidectomy.

Following these patients over a period of years and projecting new lines of investigation, it was found that a more commanding operation was a bilateral denervation of the suprarenal glands, the second denervation being performed a week or more after the first one.

The technic of denervation requires meticulous care. It necessitates the precision of Frazier's technic on the gasserian ganglion. A bloodless kidney incision, long enough to introduce the hand, is made and carried down along the upper border of the kidney including the upper pole, near which and deeper will be found the suprarenal buried in a special fat. On the right side the suprarenal lies among an important group of organs which include the diaphragm, the liver, the duodenum, the head of the pancreas, the vena cava and the kidney.

The suprarenal is soft; it cannot be subjected to traction or pressure; it has three arteries, which are not easily visualized, and it has from thirty to forty nerves. The suprarenal is the spider in the sympathetic web. It is not believed that regeneration of the nerves of the suprarenal will take place, as these nerves are, we believe, efferent, not afferent. During the manipulation the blood pressure rises sharply; sometimes it is even doubled. Spinal anesthesia is exceptionally effective in denervation, and if the operation is carried out with exact technic the risk is slight.

While operative measures are the only effective treatment in recurrent hyperthyroidism and in neurocirculatory asthenia, in peptic ulcer there are well established lines of nonoperative as well as operative treatment. Denervation is not indicated in peptic ulcer if there is obstruction at the pylorus, with retention. In a case of this type gastro-enterostomy, as Balfour has repeatedly stated, yields almost perfect results. But here is usually a healed ulcer and the operation overcomes a complication rather than cures the ulcer. Balfour has stated that gastro-enterostomy is of doubtful or no value in young, high-strung, nervous, excitable subjects. Therefore, if any operation is to be undertaken, resection of the stomach in experienced hands gives the best results. The Finney type of operation yields good clinical results in those cases in which gastro-enterostomy is indicated and especially in the borderline group which in age and in nervous tension lie between the gastro-enterostomy zone and the resection zone.

For the present, denervation for peptic ulcer is reserved for those cases in which recurrences would ensue after any type of operation or for those patients for whom a Finney operation or a gastro-enterostomy is not suitable and in the case in which for any reason resection is not to be done. Denervation should not be undertaken until nonoperative management has educated the patient into ulcer behavior. Then denervation will result in fundamental improvement which, when supplemented by management, will give relief. Of one thing we are certain; denervation results in immediate relief of symptoms, but without careful postoperative management, recurrences are seen. These conclusions are based on the results of various forms of treatment of 2,250 cases of peptic ulcer in the records of the Cleveland Clinic.

SUMMARY

It is clear that denervation will relieve and probably cure recurrent hyperthyroidism; it will relieve and probably cure with equal promptness neurocirculatory asthenia, which is a unit of pathologic physiology analogous to exophthalmic goiter. In the diseases in which emotional states, nervous strain, worry and overwork are dominating factors, such as peptic ulcer and diabetes, the principle of the operation may apply; and while the results thus far are encouraging they are not yet worked out as completely as are those for recurrent hyperthyroidism and neurocirculatory asthenia. Time and critical examination of clinical results will bring the final verdict.

Our endeavor, at this early stage, is to present the conception of an energy system which involves a group of organs that collaborate in the transformation of potential into kinetic energy. The excessive driving of this energy-controlling group or kinetic system we designate as pathologic physiology, and the surgical interventions leading to a lessening of the pathologic drive we call a dekineticizing operation.

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# NEUROGENIC FACTOR IN CHRONIC PEPTIC ULCER *

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The etiology of peptic ulcer and its pathogenesis are yet to be determined. There is evidence to show that bacterial infection, endarteritis, traumatism, toxic substances, hyperchlorhydria, improper diet, alcohol, tobacco, reflex disturbances, and certain constitutional diseases will, under certain conditions, be associated with the development of ulcers, both acute and chronic. In predisposed individuals, these and other causes seem to be capable of producing chronic peptic ulcer of both the duodenum and the stomach, and of activating ulcers that have apparently healed. Most observers admit, however, that there is some predisposing cause yet unknown. Since Virchow, in 1853, expressed the belief that peptic ulcer may be due to faulty blood supply in the stomach wall, most observers, in seeking to account for the pathogenesis of the disease, have given due prominence to possible disturbance of the circulation in circumscribed areas of the wall of the stomach and duodenum, whatever the exciting cause or causes may be.

Reeves,[1] in 1920, demonstrated by injection of the arteries that the areas in which ulcers commonly occur have a poorer blood supply than the rest of the stomach and that the capillaries do not anastomose in these areas. This, however, does not explain why the commonly accepted exciting causes will produce ulcer in one individual and not in another.

I wish to emphasize that the ulcer bearing individual belongs to a distinct type and from birth is predisposed to the development of chronic peptic ulcer. This type is the high-strung, emotional, so-called vagotonic individual, with sensitive nervous system and certain physical peculiarities which clearly distinguish him from the opposite, or sympatheticotonic, type, showing marked visceroptosis, and subject to melancholia, lassitude, headaches, atonic constipation—an easy victim of morbific influences in general. Many observers have emphasized the importance of the nervous element in the production of ulcer. Berg of New York has stated that ulcer is prone to occur in vagotonic individuals. Few surgeons, if any, however, have observed that typical chronic peptic ulcer rarely occurs in the opposite, or so-called sympatheticotonic, type. Draper, Dunn and Seegel [2] state that there is a special physical type of individual that predisposes to peptic ulcer. A. B. Rivers,[3] in seeking to account for ulcer, suggests that nervous imbalance prevents normal pyloric function and that all conditions which produce a state of excitement and its consequent disturbance of pyloric function should be avoided and the patient made as comfortable and happy as possible. Eusterman [4] observes, "There is a possibility of a relationship between ulcer and a nervous imbalance."

L. D. Snorf [5] mentions two chief predisposing factors of ulcer as being disturbances of the sympathetic system, resulting in the spasm of blood vessels and local muscles, and some peculiar disturbance of the blood vessels to the stomach and intestine.

Irving Gray [6] says: "Ulcer of the gastroduodenal tract remains secondary to some primary condition, the exact nature of which is unknown. We must conclude, therefore, that the syndrome of ulcer, especially duodenal ulcer, is a vegetative, neurotic complex, as emphasized by Westphal and Katch."

Frank Smithies [7] seems to think that peptic ulcer is usually the local expression of a systemic condition. He [8] says, "In more than 95 per cent of instances, peptic ulcer is a visceral lesion, formed as a complication of systemic, constitutional, toxic or environmental disturbances.

E. S. Judd [9] says: "Experience seems to show that there is a tendency to the formation of ulcer in certain individuals, and that no matter what treatment is undertaken, recurrence is almost certain to take place. The factor responsible for this has not been determined, and its discovery will yield valuable information concerning the etiology and pathogenesis of ulcer."

Typical peptic ulcer is apt to begin in youth, or even in childhood, at the time of life when the commonly accepted causes of the disease are not present. The young ulcer bearing person is rarely ever the type one expects an invalid to be. He recovers readily from acute diseases and from injuries, and is apt to be active, alert and enthusiastic in both work and play. In spite of this, he has a nonhealing, peptic ulcer. The diagnosis of ulcer in youth is becoming increasingly more frequent.

Rivers and Eusterman [4] make the significant statement that a result of the analysis of Mayo Clinic cases shows that the average age of patients when symptoms first occur is surprisingly low. Twenty per cent have symptoms suggesting ulcer before the age of 20, and 61 per cent have well developed symptoms before 30. They also observe that certain types of persons seem especially predisposed to reform ulcer. These include, in part,

* Read before the Section on Surgery, General and Abdominal, at the Eighty-Second Annual Session of the American Medical Association, Philadelphia, June 12, 1931.

1. Reeves, T. B.: Surg., Gynec. & Obst. **30**: 374 (April) 1920.

2. Draper, G.; Dunn, H. L., and Seegel, D.: Am. J. M. Sc. **169**: 322-328 (March) 1925.

3. Rivers, A. B.: Journal-Lancet **48**: 21 (Jan. 15) 1928.

4. Rivers, A. B., and Eusterman, G. B.: Ann. Clin. Med. **4**: 365-378 (Nov.) 1925.

5. Snorf, L. D.: Illinois M. J. **54**: 161 (Aug.) 1928.

6. Gray, Irving: New York State J. M. **28**: 780 (July 1) 1928.

7. Smithies, Frank: Ann. Clin. Med. **5**: 918 (April) 1927.

8. Smithies, Frank: The Nonsurgical Management of Peptic Ulcer by the "Physiologic Rest" Method, J. A. M. A. **85**: 674 (Aug. 29) 1925.

9. Judd, E. S.: Virginia M. Monthly **55**: 755 (Feb.) 1929.

those who are constitutionally inferior, with nervous imbalance and hyperirritability.

O. S. Proctor[10] says: "There is but little doubt that chronic peptic ulcer occurs, and is often unnoticed, in children; notwithstanding the fact that the causes usually assigned for adults are not present in children. The factors of worry, alcohol and tobacco are absent in children, and hyperchlorhydria is rare."

The symptoms of hypermotility, hypersecretion and spasticity of the pyloric sphincter are chiefly dependent on the state of the patient's nervous system and mind; and the successful treatment of patients with these symptoms by diet, rest and alkalis merely confirms the opinion that these ulcer symptoms are dependent on the state of the patient's nervous system and occur in the vagotonic rather than in the sympatheticotonic type.

It is a well known fact that patients resistant to treatment by rest, diet and alkalis often recover completely and suddenly from their symptoms when they are made happy by some occurrence. A trip to Europe, a hunting or fishing trip, or some fortunate occurrence will often cure these cases of all ulcer symptoms as if by magic. A change of residence and occupation, provided the patient is happy and contented, will result in practically 100 per cent symptomatic cures in uncomplicated cases.

Ulcer patients are made worse by influences operating through the nervous system, and all other possible causes are secondary to this. They are cured, if ever, by treatment that is successful in relieving them from emotional strain and that makes them happy and contented.

It must be apparent, I believe, to anyone who undertakes to classify dyspepsia cases according to temperament and physical differences, that the visceroptotic, relaxed patients, with pendulous abdomens and notoriously loose attachment of the viscera, subject to atonic constipation, headaches, lassitude and melancholia, are rarely ever the victims of peptic ulcer.

The important clinics of this country that deal with people who come from rural communities and small towns get about 90 per cent satisfactory results in their duodenal ulcer cases and about 80 per cent in their gastric cases; but other clinics, equally good, dealing with a different type of patient, show the most disappointing results. There can be only one reason why clinics in the cities of the West and South show better results than the group of excellent surgeons of Mount Sinai Clinic in New York or Bastianelli's clinic in Rome, for example. The difference is that in the Mount Sinai Clinic and in Bastianelli's clinic the predominating types are distinctly vagotonic individuals. These people are strikingly alike in their physical make-up and in their emotional reactions to all sorts of disturbing influences. It is their temperament, physical make-up and training and the environment in which they live, that determine their predisposition to the development of chronic peptic ulcer and are responsible for the poor results of all treatment.

Experience and common sense both seem to point to the conclusion that the mystery connected with the origin and behavior of chronic peptic ulcer is in some way connected with the patient's nervous organization and his physical make-up. In predisposed individuals, the so-called vagotonics, we have ample evidence that emotional strain, overwork, infections, tobacco, alcohol, diet, and all the rest cause ulcers to develop and to recur. Conversely, in patients with predominance of the sympathetic system, these and many other influences will more or less completely break down the patient's health but rarely, if ever, cause peptic ulcer.

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10. Proctor, O. S.: Surg., Gynec. & Obst. 41:63 (July) 1925.

## ABSTRACT OF DISCUSSION

### ON PAPERS OF DRS. CRILE AND RUSS

DR. DONALD GUTHRIE, Sayre, Pa.: The implication that there is an ulcer type of patient is, to my mind, hard to prove. I agree, however, that it is difficult for the patient belonging to the type described by Dr. Russ to obtain relief from ulcer symptoms by operation, because often much of his dyspepsia is due to the result of his reactions to his mode of life. I also agree that the patient with ulcer diathesis, the one who reforms his ulcer after its removal, undoubtedly belongs to this type, but it has not been established as yet that the majority of those who have ulcers belong to the vagotonic type. A disturbance of the sympathetic mechanism may be a precursor of ulcer formation, however. I wonder also whether there is postmortem evidence to substantiate the statement that ulcer is found so frequently in young adults. I think that we surgeons are all agreed that a medical regimen should be given a thorough trial in young patients who present the symptoms of early ulcer, and I believe that we share in the belief that operation on the lesion is the best form of treatment for chronic indurated ulcer. Dr. Crile has presented a most engaging line of thought. A report of further investigations of his beliefs will be awaited with interest. Is a new era of surgical practice about to be begun, as a result of a better understanding of the sympathetic mechanism? The present-day conception and control of formerly obscure conditions, such as Hirschsprung's disease, Berger's disease, Raynaud's disease, scleroderma, and certain forms of arthritis, would lead one to believe that this will perhaps be the outcome.

DR. CHARLES BRUCE MORTON, University, Va.: For some years I have been especially interested in the etiology of peptic ulcer and have done some experimental work which has led me to believe that the objective ulceration may be due to mechanical and chemical factors. In various experiments, ulcerations have been produced, almost at will, in from 60 to 100 per cent of experiments. In each instance the production of an apparent acid-alkali imbalance between the stomach and the duodenum seems to be the immediate cause of the ulceration and in such experiments the site of the ulceration can be predicted with extreme accuracy by plotting the direction and character of the mechanical forces brought into play by the emptying mechanism of the stomach. Ulcerations produced by these experimental procedures heal readily and rapidly when the normal acid-alkali interrelationships are reestablished. While such experiments may explain the objective ulceration, they do not explain the reason that peptic ulcer occurs in one individual and not in another although the two may be living under apparently identical conditions. Granting that ulceration will follow acid-alkali imbalance at the pylorus, one has yet to explain the reason for such an imbalance clinically. Peptic ulcer is usually found in "the high-strung, emotionally and physically active man" referred to by Dr. Crile. Such an individual is prone to suffer with various functional disorders. Many have cardiospasm or pylorospasm; some have peptic ulcer. The association of pyloric dysfunction with peptic ulcer seems to me a most significant one. If one conceives of the pylorus as the watchman of the gastroduodenal system, controlling as it does the emptying of the acid gastric chyme and the regurgitation of alkaline secretions, and if one accepts the experimental evidence that an acid-alkali imbalance at the pylorus may account for the chronicity of the objective peptic ulceration, the probable importance of the pylorus in the etiology of peptic ulcer is obvious. And in speaking of the pylorus I not only refer to the pyloric muscle but include the controlling mechanism of the pylorus. I am at present making some experiments aimed at putting the pylorus "out of step," so to speak. The results are far from complete but already suggest the importance of the rôle that pyloric dysfunction may play in the etiology of peptic ulcer. It is interesting to think of peptic ulcer in this sequence: objective ulceration due to chemical and mechanical causes, these in turn following pyloric dysfunction, the underlying factor back of it all being the inability of certain

constitutionally organized individuals to compensate for the strain of our present-day high tension life.

DR. E. P. MCCULLAGH, Cleveland: I wish to emphasize that these operations on the suprarenals are not proposed for uncomplicated hyperthyroidism and are not intended to displace thyroidectomy. The procedure called suprarenal denervation has been of especial interest to me in two groups of cases: first, a group in which there are residual symptoms of hyperthyroidism after thyroidectomy or after repeated thyroidectomies; and, second, a group of cases called neurocirculatory asthenia, effort syndrome, irritable heart, and the like, in which the differentiation from early hyperthyroidism is often difficult and in which many signs are present which suggest sympathetic stimulation. It is particularly interesting that, during the last few days, Dr. Swingle, whose work is well known, has demonstrated that the cortical suprarenal hormone can raise the basal metabolism in animals in whom the metabolism has been made to fall, not only through various causes but by thyroidectomy itself. The first chart shows the results of suprarenal operations for residual hyperthyroidism. In seven cases, left suprarenalectomy was performed. In five of these the symptoms were not controlled and in two they were controlled. Unilateral suprarenal denervation was performed in two cases, followed by abatement of symptoms in both, and bilateral denervation in eight cases, with abatement of symptoms in seven. It will be seen that suprarenal denervation obviously has afforded relief in a larger proportion of cases than has unilateral suprarenalectomy. These operations were performed from three and one-half years ago to one month ago. They include only such cases as I have observed; any cases in which an accompanying thyroid operation was performed are not included. These patients received iodine while they were in the hospital but have received none since their discharge. The second chart shows the results, to date, of suprarenal operations in cases of neurocirculatory asthenia which I have observed. Four left suprarenalectomies plus thyroidectomy were followed by relief in two cases and no relief in the other two. In one case, in which only suprarenalectomy was performed, the symptoms were not controlled. Suprarenal denervation was done in ten cases. In three patients unilateral denervation was done and in two of them the symptoms were controlled. In seven cases bilateral denervation was performed, in six of which the symptoms have abated.

DR. JOHN J. GILBRIDE, Philadelphia: The first essential for the successful management of peptic ulcer is an exact diagnosis: (1) the location and character of the ulcer; (2) the number of ulcers present; (3) the presence of complications, and (4) associated conditions. When these points have been decided, it is possible to apply the most efficient treatment for the individual patient. Incomplete examinations and incomplete studies of cases are frequent causes of overlooking the presence of ulcer and the subjecting of patients to operations on the appendix and gallbladder. It is necessary to divide ulcer patients into those who are suitable for medical treatment and those who require surgical operation plus medical treatment, because all patients operated on require medical supervision. Most of the patients with simple uncomplicated ulcer get well under medical treatment and most of those who require surgical operation get well after excision of the ulcer, and if necessary one of the simpler operations such as pyloroplasty or a gastrojejunostomy. Extensive operations should be reserved for patients whose diseases are resistant to these other methods of treatment. It is true that peptic ulcer disease persists in a small percentage of cases, and perhaps it is in this group of cases that those extensive methods of surgical operation recommended would find their greatest field of application.

DR. CHARLES E. B. FLAGG, Vancouver, Wash.: In this age of specialization, the recommendation by a surgeon of treatment of the patient's emotional system as well as of the lesion is highly gratifying. I should like to emphasize that the hunger pain must first be relieved by diet and medication, before an attempt is made to improve mental conditions. I find it difficult or impossible to divert the patient and make him contented while he is having pain in the abdomen.

DR. WITTEN B. RUSS, San Antonio, Texas: It is quite true that it has not yet been proved that ulcer occurs only, or chiefly, in the vagotonic type; nor, on the other hand, has it been proved that typical chronic peptic ulcer ever occurs in the opposite, or sympatheticotonic, type. I think the reason is that ulcers are never classified according to type. When this is done, and the observations are confirmed by surgical operation, it will be found that most, if not all, the chronic peptic ulcers occur in vagotonic patients. A careful study of all ulcer cases to determine the age at which symptoms first appeared, and with especial attention to the type of the individual, will throw much light on this subject.

DR. GEORGE W. CRILE, Cleveland: My purpose in this paper was briefly to express the point of view that there is perhaps a principle by which one may attack some of these problems. Later, I propose to give a report on the final end-results. It will take time and careful study of the clinical end-results before one is certain of one's ground, but if one should be fortunate in suggesting a principle, in suggesting perhaps another way of looking at these difficult problems, their solution will certainly be greatly facilitated.

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# THE TREATMENT OF POLIOMYELITIS

## RESULTS IN A SERIES OF ONE HUNDRED AND FOUR CASES *

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The ability of serum containing actively antiviral substances to affect the course of poliomyelitis after symptoms have appeared is a consideration of utmost importance in the treatment of the disease with convalescent or other serum. In comparison to this major consideration, dosage and method of administration are probably of secondary significance.

Serum of human beings and monkeys convalescent from the disease has been shown to have definite antiviral properties [1] and if injected into monkeys before the intracerebral inoculation of virus or if mixed with virus so injected will definitely prevent the development of characteristic symptoms. The crucial tests of therapeutic usefulness cannot be carried out in monkeys, since these animals are relatively insusceptible to the disease and develop it only in response to the highly artificial inoculation of massive doses of virus. The experimental disease thus produced runs a course which cannot be greatly influenced by subsequent injection of serum. Unfortunately, from the standpoint of therapeutic observations, spontaneous infection has never been observed in monkeys. It is equally true, of course, that experimental inoculation has not been tried on human beings.

Clinical trials of such an agent are thus restricted to human beings, under conditions which unavoidably depart from those ideal for laboratory experiment. The experience of many observers [2] gives definite encouragement to the view that the course of the disease may be beneficially influenced by the use of convalescent serum. From the theoretical standpoint, the hope of successfully combating the disease lies in the differences existing between the disease produced in relatively

* From the Department of Communicable Diseases, Children's Hospital, and the Pediatric Department of the University of California Medical School.

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2. Amoss, H. L., and Chesney, A. M.: A Report on the Serum Treatment of Twenty-Six Cases of Epidemic Poliomyelitis, J. Exper. Med. **25**: 581-608 (April) 1917. Zingher, Abraham: The Diagnosis and Serum Treatment of Anterior Poliomyelitis, J. A. M. A. **68**: 817 (March 17) 1917. Aycock, W. L., and Luther, E. H.: Preparalytic Poliomyelitis, J. A. M. A. **91**: 387 (Aug. 11) 1928. Shaw, E. B., and Thelander, Huldah E.: Intramuscular Use of Convalescent Serum in Treatment of Poliomyelitis, J. A. M. A. **90**: 1923 (June 16) 1928.

insusceptible monkeys by artificial inoculation of virus and the slower, progressive, spontaneous infection of susceptible human beings, involving less overwhelming doses.

A small series of cases cannot conclusively prove or disprove the value of serum. Such a small series may include mild clinical cases, those in which there is spontaneous recovery, or those erroneously diagnosed and thus seem to indicate successful results; on the other hand, the inclusion of several fulminant cases, or those treated with inert serum, or with too little serum, or those in which serum was applied late may seem to indicate poor results.

Acceptable clinical deductions can be made only during epidemics of fairly classic forms of the disease in which observations are made on a group of cases which is sufficiently large to give an accurate cross section of an epidemic. The ideal method for such study would be, of course, to attempt specific treatment of control groups. This requires considerable hardihood, particularly to resist the temptation actively or unconsciously to select cases for treatment, and further necessitates the difficulty of explaining to patients and parents why one case is treated and another is not. If all cases in an epidemic were to be diagnosed by the same criteria and divided alternately between two clinicians, one convinced of the value of specific therapy and treating his cases energetically and the other one proceeding on his conviction of the futility of such treatment, significantly comparable results might be obtained.

All cases entering the Children's Hospital were managed on the hypothesis that, if actively antiviral serum was given sufficiently early, the progress of the disease could be affected. It was our feeling that occasional failures, which occur in any type of specific therapy, do not in themselves disprove the value of the procedure. Results were to be regarded as strongly corroborative of the value of the serum only if they outstandingly departed from the generally encountered end-results in these cases. It is unfair, on the other hand, to compare this group with a similar numerical group in the city at large under the care of various clinicians whose criteria for diagnosis and treatment may have differed greatly from ours.

In 1930 there were reported to the San Francisco board of health 230 cases of poliomyelitis. Of the patients, 27 died (a mortality of 11.7 per cent) and 172 were reported as showing some paralysis. The series forming the basis for our present report consists of the 104 cases treated at Children's Hospital. No case has been excluded in which the diagnosis could be definitely made. The diagnosis in these cases rests on history, especially history of exposure, physical examination, observations on the spinal fluid and, in some cases, on the appearance of transitory or persistent paralysis. An earnest attempt has been made to follow up all cases to determine their status several weeks after dismissal.

In treating these cases an effort was made to give the serum at the earliest moment at which the diagnosis could be established. It was never given on suspicion.

Cases are divided into three groups: (1) that in which serum was given before the onset of any demonstrable paralysis; (2) a group in which the serum was given after the onset of paralysis but during the period of extension in which temperature was still elevated, and (3) a final small group which entered after the subsidence of the acute course, in which serum was not administered.

It is reasonable to expect more favorable results in the first group in which there is no evidence of nerve cell damage and in which the virus presumably is more accessible to the general circulation than after the onset of paralysis when there is damage to the nerve cells involving much inflammatory edema and ischemia.

TABLE 1.—*Fifty-Three Cases Treated Before Onset of Paralysis*

| | No. of Cases | Average Age | Average Cell Count | Average Day of Treatment | Average Amount of Serum |
|---|---|---|---|---|---|
| No paralysis | 28 | 9.5 | 146 | 2.7 | 120 |
| Transient weakness | 15 | 10 | 119 | 3.6 | 151 |
| Definite paralysis | 9 | 17 | 197 | 3.4 | 209 |
| Death | 1 | 9 | 270 | ... | 375 |

**No Paralysis**

| Case | Age | Cell Count | Serum | Day | Case | Age | Cell Count | Serum | Day |
|---|---|---|---|---|---|---|---|---|---|
| R. B. | 13 | 160 | 75 | 3 | A. J. | 39 | 65 | 130 | 3 |
| M. A. | 10 | 675 | 90 | 7 | | | | 40 B | 4 |
| J. P. | 1½ | 150 | 60 B | 1 | M. R. | 4 | 226 | 90 | 3 |
| | | | 35 | 2 | | | | 40 S | 4 |
| J. C. | 3½ | 87 | 90 G | 2 | B. N. | 5½ | 166 | 75 | 2 |
| H. P. | 4½ | 45 | 50 | 1 | | | | 25 | 3 |
| | | | 50 | 2 | M. H. | 13 | 213 | 100 | 4 |
| P. B. | 5½ | 12 | 50 | 2 | | | | 100 | 5 |
| E. S. | 15 | ... | 100 | 2 | R. S. | 7 | 88 | 45 S | 10 |
| | | | 150 B | 3 | G. L. | 22 | 65 | 165 | 4 |
| W. C. | 3 | 114 | 50 | 1 | | | | 100 S | 5 |
| S. M. | 8 | 31 | 45 B | 5 | S. V. | 3½ | 32 | 40 S | 3 |
| H. A. | 5 | 33 | 50 S | 4 | A. M. | 10 | 176 | 100 B | 1 |
| | | | 50 | | | | | 75 S | 2 |
| J. K. | 8 | 16 | 50 S | 12 hrs. | H. B. | 9 | 70 | 120 | 4 |
| O. K. | 6 | ... | 50 | 1 | N. G. | 5 | 129 | 45 | 1 |
| M. P. | 8 | 220 | 90 S | 1 | | | | 80 | 2 |
| | | | 75 S | 2 | H. S. | 7 | 143 | 100 | 1 |
| M. C. | 6 | 302 | 70 | 2 | | | | 50 | 1½ |
| | | | 45 S | | J. M. | 6 | 450 | 75 B | 2 |
| | | | 25 S | 3 | | | | 80 B | 3 |
| | | | 50 | | M. H. | 31 | 38 | 130 | 3 |
| | | | 50 B | | | | | | |
| A. K. | 7½ | 87 | 80 | 1 | | | | | |
| | | | 50 | 2 | | | | | |

**Transient Weakness**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| E. R. | 7 | 70 | 150 G | 3 | N. S. | 8 | 219 | 60 | 1 |
| J. B. | 5 | 238 | 50 | 3 | | | | 90 B | 2 |
| | | | 50 | 4 | M. B. | 7 | 27 | 50 | 2 |
| K. F. | 9 | 150 | 40 B | 5 | M. M. | 11 | 92 | 50 | 4 |
| | | | 20 | | | | | 100 B | |
| W. B. | 14 | 123 | 50 | 8 | H. K. | 11 | 10 | 70 | 1 |
| | | | 50 S | | | | | 50 S | |
| F. B. | 9 | 116 | 45 S | 6 | | | 96 | 90 S | 6 |
| | | | 45 S | 7 | M. R. | 5 | 36 | 70 S | 3 |
| | | | 50 | | | | | 43 | 4 |
| | | | 60 S | 9 | | | | 75 B | 5 |
| I. R. | 3 | 113 | 60 B | 3 | E. B. | 8 | 106 | 70 S | 3 |
| H. F. | 10 | 117 | 80 | 3 | | | | 50 S | 4 |
| | | | 45 | 4 | M. M. | 31 | 136 | 220 | 5 |
| | | | 100 B | | | | | 200 BT | 6 |
| | | | 50 G | | A. S. | 12 | 220 | 55 | 4 |

**Definite Paralysis**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M. B. | 32 | 90 | 40 | 7 | M. S. | 36 | 154 | 95 | 4 |
| | | 110 | 50 G | | | | | 90 BT | |
| | | | 50 G | 11 | | | | 50 | 5 |
| | | | 50 | | | | | 50 | 6 |
| A. S. | 13 | 350 | 85 | 1 | T. M. | 30 | 103 | 100 | 1 |
| | | | 80 | 2 | | | | 175 B | 2 |
| | | | 50 | 3 | | | | 160 BT | 3 |
| S. B. | 11 | 269 | 100 | 2 | M. S. | 2 | 147 | 95 | 3 |
| A. R. | 6 | 177 | 75 | 2 | | | | 65 B | 4 |
| R. J. | 1½ | ... | 50 S | 6 | I. S. | 21 | 283 | 140 | 5 |
| | | | 45 S | 7 | | | | 100 | 6 |
| | | | | | | | | 90 | |

**Death**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| R. N. | 9 | 270 | 75 | 1 | | | | | |
| | | | 50 G | | | | | | |
| | | | 50 | 2 | | | | | |
| | | | 100 B | 3 | | | | | |
| | | | 100 G | | | | | | |

Various serums were used, many patients receiving serum from several sources. Treatment consisted of (*a*) pooled convalescent plasma supplied by the Hooper Foundation, given intramuscularly; (*b*) unpooled plasma freshly obtained from recent convalescents, given intramuscularly; (*c*) citrated whole blood from recent convalescents, given intramuscularly or by transfusion; (*d*) serum from immunized goats and sheep, prepared

as reported elsewhere,[3] given intramuscularly. In order to conserve the pool of the Hooper Foundation for general use, much of the convalescent plasma used was freshly obtained from convalescents still in the hospital (*b*). Large doses were employed and we particularly did not rely on single doses but continued to give injections, if possible from varying sources, at intervals of from twelve to twenty-four hours until the active stage of the disease seemed to be over. Since it was impracticable to attempt to determine the potency (by monkey inoculations), of all our serums, we attempted by thus giving repeated injections from varying sources to insure the application of potent serum to each case. This necessitated the use of larger amounts of serum or plasma than can be recommended as a routine because of the difficulty of obtaining it. If, however, such a virucidal agent can be proved definitely effective, the problem of treatment is to provide known potent tested serum for every case of poliomyelitis, an end which, it is to be hoped, serum from immunized animals will fulfil.

Table 1 shows the results obtained in fifty-three cases treated before the onset of demonstrable paralysis. In each case are given the initials, the age, spinal fluid cell count, the dose of serum, and the day of the disease on which each dose of serum was given. The serum used was human serum or plasma unless noted by a symbol; symbol B indicates that blood was given intramuscularly; symbol BT refers to blood transfusion; S indicates sheep serum; G indicates goat serum. The animal serum used was from the immunized animals to which reference was previously made.[3]

Of the fifty-three patients, twenty-eight recovered without showing any signs of muscular weakness, the temperature subsiding rapidly to normal in some cases and more gradually in others. The use of animal serum produced varying degrees of serum reaction, which caused confusing clinical charts.

In fifteen patients, in spite of a greater average amount of serum, some muscle weakness developed, which was, however, slight and sometimes trifling in extent and which had disappeared completely at the end of three weeks, the period of quarantine. In nine of these fifty-three cases, persistent paralysis of varying extent developed, despite treatment, and one child of 9 years died.

All four types of end-results justify further comment. In the cases in the first group in which there was no demonstrable paralysis at any time there were doubtless some which would have run, without treatment, a benign course. It is impossible, we believe, to say which of these cases would have been spontaneously abortive. To be sure, such cases as P. B. and J. K. showed cell counts of only 12 and 16 per cubic millimeter, but these were diagnosed and treated extremely early in the disease on the basis of exposure and preparalytic symptomatology, and the cell counts, though low, showed a high percentage of polymorphonuclear cells. The highest counts of the whole number, on the other hand, were seen in M. A. and J. M., who made prompt and uneventful recoveries. We were most impressed at the bedside with such cases as those of W. C., M. C., M. P. and M. H., all of whom were desperately ill children. M. C. in particular was a very ill child of 6 years whose playmate died elsewhere of poliomyelitis two or three days before the former's entrance into the hospital. The condition of this child was alarming from the outset; the disease ran a stormy course and the child was given several doses of serum, as reference to the table will show, but at no time did she show any paralytic phenomena.

That some of this group might unaided have continued unparalyzed is likely enough, but symptoms in the group as a whole were certainly as severe during their febrile course as those of the preparalytic stage in severe cases of paralysis.

Those cases in which transient paralysis was observed were, at least, unquestionably paralytic in character. Most of these exhibited weakness for only a day or two. Several, especially H. F. and N. S., were very ill. In the former, a girl, aged 10, who had been in contact with her cousin, R. M., who entered the hospital paralyzed, facial weakness and other bulbar signs developed a few hours after entry, and twenty-four hours later the child was delirious. During this period of rapid progression threatening a fatal outcome, she was given three doses of human blood and plasma, and abruptly improved following a final dose of goat serum. She left the hospital at the end of her quarantine period with no demonstrable weakness.

The cases in which paralysis developed despite treatment were somewhat discouraging, but a more detailed consideration of their course gives in certain instances at least a plausible explanation for this apparent failure. Two patients, M. S. and R. H., were infants, aged 1½ and 2 years, who had been ill three and six days, respectively. Both resisted examination so much on entry that it is altogether probable that deltoid weakness which was later detected was present on entry. Both of these patients have since recovered, the first almost completely, the other one entirely, from the paralysis which was present. Two children, S. B., aged 11, and A. R., aged 6, had single doses of plasma, which in view of their unfavorable progress should preferably have been repeated. A. S., a girl, aged 13, although she entered the hospital unparalyzed, had a rapidly advancing case and had definite weakness and reflex changes at the end of twelve hours after entry. Her paralysis did extend, however, during the next two or three days. Two patients, M. D. and M. S., were adults who had been ill several days before entry and had the curious encephalitic type of the disease encountered most frequently in adults. They later showed paralysis. T. M., a man, aged 30, had paresthesias in his right arm from almost the moment of onset. His first dose of serum was given when his temperature was mounting; afterward, transfusion was done; his clinical chart somewhat justifies the impression that a specific result was obtained, but weakness quickly developed in his right arm, which persists to the present time.

The treatment of cases in adults is a distinct problem, and results in the recent epidemic were discouraging. In adults one saw a less conventional type of the disease and steadily progressive, severe or fatal forms were the rule. The adult is not the usual victim of poliomyelitis; it seems reasonable to surmise that adults are affected only by overwhelming amounts of virus, which, surmounting their natural barriers against the infection, produce a fulminating type of the disease. The amount of serum necessary to saturate the patient is a further factor in treatment. Chief reliance was placed in the use of large doses of plasma and particularly on blood transfusion from recent convalescents. Some of the results were at least encouraging. One such patient in

3. Howitt, Beatrice F.; Shaw, E. B.; Thelander, Huldah E., and Limper, Margaret: The Immunization of Goats and Sheep to Poliomyelitis Virus, J. A. M. A. **96**: 1280 (April 18) 1931.

the transiently paralyzed group, M. M., a woman, aged 31, who was severely ill, responded to such a transfusion of 200 cc. by a precipitate drop in temperature but subsequently was found to have slight weakness of the shoulder girdle, which cleared in less than three weeks.

The single fatality in this group was in the case of R. N., aged 9. On entry, her symptoms of the disease were not more marked than those of many patients who completely recovered, but she had been ill with bronchitis for two weeks before entry. This bronchial infection was evident throughout the course of her poliomyelitis and contributed to the fatal outcome. After a period of preparalytic symptoms, despite energetic therapy she passed into a paralytic stage which

TABLE 2.—*Thirty-Nine Cases Treated After Onset of Paralysis*

| | No. of Cases | Average Age | Average Cell Count | Average Day of Treatment | Average Amount of Serum |
|---|---|---|---|---|---|
| Transient weakness | 9 | 6.8 | 67 | 3.7 | 84 |
| Definite paralysis | 23 | 11.7 | 194 | 4.2 | 156 |
| Death | 7 | 10.8 | 199 | 6.3 | 156 |

**Transient Weakness**

| Case | Age | Cell Count | Serum | Day | Case | Age | Cell Count | Serum | Day |
|---|---|---|---|---|---|---|---|---|---|
| D. P. | 5 | 113 | 50 | 2 | R. M. | 7 | 89 | 75 | 3 |
| R. K. | 5 | 26 | 50 G | 1 | S. G. | 11 | 52 | 150 B | 6 |
| V. F. | 6 | 117 | 45 | 7 | L. C. | 10½ | 84 | 70 S | 3 |
| | | | 45 | 8 | V. M. | 8 | 96 | 100 | 3 |
| G. B. | 3 | 26 | 50 S | 7 | | | | 75 B | 4 |
| V. G. | 6 | 2 | 45 G | 1 | | | | | |

**Definite Paralysis**

| Case | Age | Cell Count | Serum | Day | Case | Age | Cell Count | Serum | Day |
|---|---|---|---|---|---|---|---|---|---|
| P. G. | 8 | 77 | 75 | 4 | H. S. | 6 | 83 | 50 S | 3 |
| A. B. | 5 | ... | 50 G | 3 | | | | 30 | 4 |
| | | | 45 | | | | | 50 | 5 |
| A. Q. | 12 | 239 | 100 | 3 | G. C. | 11 | ... | 50 G | 4 |
| | | | 50 | 4 | J. M. | 13 | 217 | 120 S | 5 |
| P. B. | 4 | 352 | 50 | 2 | | | | 50 S | 6 |
| | | | 35 | 3 | G. L. | 9 | 267 | 75 S | 2 |
| E. H. | 14 | 253 | 100 G | 2 | | | | 50 S | 3 |
| | | | 50 | 3 | L. B. | 26 | 419 | 90 | 6 |
| | | | 50 | 4 | | | | 200 BT | |
| F. H. | 3 | 87 | 50 G | 7 | L. F. | 8 | 358 | 75 | 4 |
| | | | 50 G | 8 | | | | 65 B | |
| D. H. | 6½ | 121 | 50 S | 7 | | | | 80 S | 5 |
| | | | 60 | 8 | S. C. | 9 | 111 | 100 | 4 |
| R. R. | 6½ | 173 | 50 | 5 | | | | 80 B | 5 |
| R. G. | 14 | 230 | 100 | 3 | | | | 60 BT | 5 |
| | | | 50 | 4 | E. D. | 12 | ... | 50 | 4 |
| R. H. | 32 | ... | 75 | 6 | R. M. | 6 | ... | 50 | 3 |
| I. J. | 31 | 70 | 100 | 5 | L. R. | 12 | ... | 100 | 6 |
| | | | 50 | 6 | V. M. | 2 | 40 | 55 | 4 |
| | | | 50 G | 6 | | | | 40 S | |
| M. B. | 20 | ... | 100 | 5 | | | | 50 | 5 |
| | | | 100 | 8 | | | | | |

**Death**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| A. P. | 7 | 136 | 100 B | 7 | A. H. | 17 | ... | 50 B | 5 |
| | | | 25 | 8 | M. M. | 18 | 250 | 100 | 7 |
| M. M. | 35 | 108 | 75 | 7 | | | | 70 | |
| | | | 100 B | 8 | | | | 100 G | 8 |
| D. S. | 20 | 305 | 90 G | 7 | M. F. | 11 | 44 | 50 | 6 |
| J. A. | 31 | 370 | 250 | 4 | | | | 80 B | |

involved more or less all four extremities and completely paralyzed her respiration. She was kept in the respirator for over two weeks, finally succumbing as a result of pneumonia.

Cases treated after the onset of paralysis, of which there were thirty-nine in this series, do not constitute from the standpoint of interpretation of results nearly so clean cut a group as the former ones. Nevertheless, the distinct impression gained from bedside observation of these patients, who, though already paralyzed were still in the actively febrile stage of the disease, was that the course after the administration of serum was more favorable than one might reasonably have expected. Several, in particular E. H., had dromedary types of the disease, in which expected extension did not materialize after treatment was given.

Nine patients in this group not only failed to show extension of the paralysis but had completely recovered at the end of their quarantine period. Most of these cases of transient paralysis were of the bulbar variety; it will be noted that the average spinal fluid counts were low, which is consistent with the frequency of bulbar localization. It has been our general experience that bulbar cases are apt to exhibit paralytic phenomena at a relatively early stage of the disease and that they are therefore to be regarded somewhat more favorably for treatment than are cases presenting paralysis of spinal origin.

Twenty-three patients who entered the hospital actively ill, with some paralysis, recovered with persistent paralysis, but in hardly a single one of these cases was there extension after serum was given. One is not justified, of course, in drawing sweeping conclusions from such cases as these, but it was a frequent observation in the recent epidemic that extension of paralysis developed over a period of several days instead of showing the maximum paralysis in a few hours at the end of the preparalytic stage.

Seven of the patients treated in this stage succumbed to their infection. Of these, A. P., one of our first patients during the epidemic, entered the hospital badly paralyzed, with respiratory involvement. M. M., a woman, aged 35, also entered badly paralyzed and had beginning respiratory involvement; she later succumbed while under treatment with the respirator. D. S., J. A., M. M., A. H., and M. E. all reached us practically moribund, in the advanced stages of bulbar and respiratory involvement, and died after a period in the hospital of from six to thirty-six hours. It is worthy of note that only three of the fatal cases of our entire group were under treatment long enough to have been affected in any possible way by the treatment.

The final group of twelve cases calls for no comment. It consists of patients who entered after the febrile period; eleven had persistent paralysis, and one who entered moribund died a few hours after admission.

## SUMMARY

One hundred and four patients with poliomyelitis were admitted to Children's Hospital in the period from July 1 to Dec. 31, 1930. Specific therapy was attempted in ninety-two cases.

Of fifty-three patients treated before the onset of paralysis, twenty-eight showed no paralysis at any time, fifteen showed transient weakness which had entirely disappeared before dismissal, nine showed persistent paralysis and one died.

The average age of the unparalyzed patients was 9½ years; of the transiently paralyzed, 10 years, and of those with definite paralysis, 17 years. This is at least significant to the hypothesis that better results are obtained in the lower age group.

The average spinal fluid cell count was 146 in the unparalyzed group, 119 in the transiently paralyzed group, 197 in the persistently paralyzed group, and 270 in the single fatality. These averages were made up from widely varying individual cases and, we believe, are without significance.

Serum was applied, on the average, 2.7 days after onset of symptoms in the unparalyzed group, 3.6 days in those with transient paralysis, and 3.4 days in those with persistent paralysis.

The average amount of serum used in the group treated preparalytically was, respectively, 120, 151, 209, and 375 cc.

In the group treated in the acute stage after the appearance of demonstrable weakness, of thirty-nine patients, nine showed transient weakness; twenty-three had persistent paralysis, and seven died.

The average age in those with transient weakness was 6.8 years; 11.7 years in those with persistent paralysis, and 19.8 years in the fatal cases, again showing the higher average age in those with serious outcome.

Average cell counts were 67 in the transiently paralyzed, 194 in those with persistent paralysis and 199 in the fatal cases.

Treatment was instituted on the average of 3.7 days after onset of symptoms in the transiently paralyzed, 4.2 days in the cases of paralysis and 6.3 days in the fatal cases, coinciding with the general idea of the importance of early treatment.

The transiently paralyzed patients received an average of 84 cc. of serum or plasma, the permanently paralyzed 156 cc., and in the fatal cases 156 cc. was given.

TABLE 3.—*Summary of Results in All Cases*

| | No. of Cases | Average Age in Years | Average Cell Count | Average Day of Treatment | Average Amount of Serum, Cc. |
|---|---|---|---|---|---|
| **Cases Treated Before Onset of Paralysis (53)** | | | | | |
| No paralysis | 28 | 9.5 | 146 | 2.7 | 120 |
| Transient weakness | 15 | 10 | 119 | 3.6 | 151 |
| Definite paralysis | 9 | 17 | 197 | 3.4 | 209 |
| Death | 1 | 9 | 270 | ... | 375 |
| **Cases Treated After Onset of Paralysis, Still Acute (39)** | | | | | |
| Transient weakness | 9 | 6.8 | 67 | 3.7 | 84 |
| Definite paralysis | 23 | 11.7 | 194 | 4.2 | 156 |
| Death | 7 | 19.8 | 199 | 6.3 | 156 |

Summary of All Cases: Total 92

| | Total No. of Cases | No Permanent Paralysis | Definite Paralysis | Death |
|---|---|---|---|---|
| Cases treated before onset of paralysis | 53 | 84.4% | 16.9% | 1.9% |
| Cases treated after onset of paralysis, still acute | 39 | 23.08% | 59.0% | 18.6% |
| Total | 92 | 56.5% | 34.8% | 8.7% |

A summary of results in all cases is shown in table 3. Of the fifty-three patients treated before the onset of paralysis, 83.4 per cent showed no permanent paralysis; 16.9 per cent showed definite persistent paralysis, and 1.9 per cent died. Of the thirty-nine patients treated after the onset of paralysis while the disease was still acute, 23.08 per cent showed no end paralysis, 59 per cent showed definite paralysis and 18 per cent died. It is unfair to attempt to compare the results in these two groups of cases. While the first group included at least a few benign cases, the second group included many extremely virulent cases referred to the hospital because of their fulminant course.

## CONCLUSION

Such a series of cases, like every other series with which we are familiar, is far from being a conclusive answer to the problem of treatment of poliomyelitis; it seems to us, however, fairly convincing evidence of the value of such treatment. To have watched these patients one by one was far more convincing than such a statistical report as this can possibly show, even if one discounts the enthusiasm which must inevitably attend the pursuit of such a problem. It is our conviction that the use of known highly immune serum will be productive of consistent results and that hyperimmune animal serum offers the greatest promise in this direction.

384 Post Street.

# *Clinical Notes, Suggestions and New Instruments*

## PULMONARY EMBOLISM: REPORT OF CASE *

WALTER FREEMAN, M.D., PH.D., WASHINGTON, D. C.

This case of pulmonary embolism is reported on account of the exceptional size of the embolism and the clarity of its demonstration.

J. M., a white woman, aged 61, had varicose ulcerations on both legs and developed cellulitis on the left side. Under hot packs this cleared up after five days and the patient was allowed up in a wheel-chair. The heart was not enlarged; there was a soft systolic murmur audible over the whole precordium, and extrasystoles were present. The blood pressure was 170 systolic and 80 diastolic; the electrocardiogram was not abnormal. When the patient rose from her chair preparatory to discharge she complained of feeling weak and of being unable to stand. Almost immediately she became dyspneic and cyanotic, and thrashed about in bed fighting for air. She was pulseless and the cardiac sounds were barely audible. Eight or ten minutes after the onset the cardiac action ceased, while a few more gasping breaths were taken. The clinical diagnosis was pulmonary embolism from thrombophlebitis of the left leg.

Necropsy disclosed marked dilatation of the right side of the heart, with a little excess fluid in the pericardial cavity. Before the relations were disturbed the pulmonary artery was incised and a little dark blood escaped, followed by a loop of thrombus. When this was withdrawn it was found to measure 43 cm. in length and to be about the diameter of the saphenous vein. It was doubled on itself and it almost completely occluded the main pulmonary artery. It was smooth, partially decolorized, and at one end had a threadlike projection of darker color. In addition to the main embolus there were found two other coiled thrombi of about the same caliber, one located in the main branch of each pulmonary artery. They were doubled on themselves rather irregularly, were easily withdrawn, and resembled exactly the texture of the main embolus. The inferior vena cava, the iliac and the femoral veins were investigated without any roughening of their walls or thrombosis being found. The area of cellulitis, on incision, yielded some dark fluid blood, but no thrombi were found. It is presumed that the thrombus formed in the saphenous vein as a result of the cellulitis and grew upward without adhering to the wall of the vein, finally becoming sufficiently bulky so that parts broke off in response to movement of the lower limbs, followed finally by the main mass.

## ALLERGIC EPILEPSY: REPORT OF A CASE IN A THREE YEAR OLD CHILD

SAMUEL J. LEVIN, M.D., DETROIT

*History.*—L. S., a girl, aged 3 years, seen, Sept. 12, 1929, had a negative family history for tuberculosis, syphilis and allergy. There were two other children in the family alive and well.

The patient had been breast fed for four months and had been given cod liver oil and orange juice at 2 months. She sat at 6 months, walked and talked at 13 months. Between the ages of 2 and 3 years, she had mumps, chickenpox and whooping cough.

When she was between 2 and 3 months old she began to turn blue and hold her breath. This occurred at first two and three times daily; then about every week to a month. These attacks seemed to be precipitated by loud noises or fright. The attacks ceased at 1 year, and except for the contagious diseases mentioned she seemed perfectly well. In August, 1929, she began to have attacks every few days, characterized by falling down and becoming unconscious. The child would be stiff, her eyes would stare, and she would become bluish. She would then become limp. The attack would last about a minute and was followed by weakness and drowsiness. The child was seen by a neuropsychiatrist, Dr. Theophile Raphael, who suspected an allergic basis for the epileptiform seizures and referred the patient for investigation.

* From St. Elizabeth's Hospital.

*Examination.*—The child appeared to be well nourished, well developed and bright for her age. The skin and glands were normal. The pupils were equal and reacted well to light. There was no squint. The teeth were in good condition, the tonsils small. The mucous membrane was clean. The ears were normal; hearing was good. The heart and lungs were normal. The abdomen was soft, with no masses; the spleen and liver were not enlarged. There were no deformities, rigidity, weakness or palsies of the extremities. The elbow, knee and ankle jerks were equal and active; no Babinski or Brudjinski signs were noted.

*Laboratory Tests.*—The urine was negative for albumin and sugar; the Kahn and Wassermann blood tests were negative; the Pirquet test was negative. Seventy-six tests were done by the scratch method with the use of a dry protein extract. The patient reacted strongly to American cheese, slightly to Swiss and Roquefort cheese.

*Course.*—The child was placed on a cheese-free diet, which was maintained for a period of nine weeks. During this time no attacks occurred. The mother then gave the child a cheese sandwich, and a very severe epileptiform attack occurred. The child was not given cheese again until January, 1931. During this interval she was again free from attacks. In January when she ate some cheese she developed a sudden attack of abdominal pain and vomiting and a temperature of 104 F. which lasted twenty-four hours. The abdominal pain and vomiting lasted four days. I did not see the patient during this illness, but the physician in attendance stated that the physical examination was entirely negative. Since that illness the child has remained perfectly well on a cheese-free diet. Skin tests at present show a very slightly positive reaction to American, Swiss and Roquefort cheese.

### COMMENT

The association of allergy and epilepsy was first mentioned by Pagniez and Lieutaud,[1] who noted the frequent occurrence of other manifestations of allergy in certain epileptic cases. The first case definitely allergic in nature was reported by them in a young man whose seizures were precipitated by chocolate. Wallis, Nichol and Craig [2] found positive skin tests in 46 of 122 epileptic patients. They were able to control and reduce the attacks in some of their patients by diets that eliminated the foods to which the patients reacted. Ward and Patterson [3] found positive skin reactions in 37 per cent of 500 epileptic patients whom they tested. They suggested treatment of these cases by elimination and desensitization but did not report the result of such treatment.

Spangler,[4] in 100 cases of epilepsy, found that 24 per cent showed a positive family history, and 88 per cent showed other allergic manifestations such as migraine, urticaria, hay fever and eczema. In a few of his cases the attacks could be avoided when specific foods were eliminated. Miller [5] and Spangler [4] have suggested that the results in some cases controlled by the ketogenic diet may be due to elimination of a specific food to which the patient was sensitive.

In two of the cases reported by Wallis, Nichol and Craig [2] the children were each 5½ years of age. One reacted to eggs and vegetables, the other to cereals, especially oatmeal. In both cases the seizures ceased when the children were placed on diets eliminating the substances to which they reacted.

I [6] previously reported a case of epilepsy in a child of 3 years. This patient was seen at the University Hospital at Ann Arbor with Dr. J. P. Parsons, who performed the skin tests. The child was found sensitive to cat hair. Following the removal of a cat from the child's environment the epileptiform attacks cleared up.

In view of the possibility that some cases of epilepsy may be allergic in nature, a careful and complete performance of sensitization tests seems advisable. Especially should a careful investigation from the allergic standpoint be made in those cases presenting a past or present history of other allergic manifestations, or a positive family history of allergy.

### SUMMARY

1. A case of epilepsy in a child, aged 3 years, due to cheese sensitization is presented.

2. A careful investigation of epileptic patients from the allergic standpoint seems advisable.

914 Maccabee Building.

1. Pagniez, P., and Lieutaud, P.: Phénomènes de type anaphylactique dans la pathogénie de certaines crises comitiales, Presse méd. **27**: 693 (Nov. 19) 1919.
2. Wallis, R. L. M.; Nichol, W. D., and Craig, M.: The Importance of Protein Hypersensitivity in the Diagnosis and Treatment of a Special Group of Epileptics, Lancet **1**: 741 (April 14) 1923.
3. Ward, J. F., and Patterson, H. A.: Protein Sensitization in Epilepsy: Study of One Thousand Cases and One Hundred Normal Controls, Arch. Neurol. & Psychiat. **17**: 427 (April) 1927.
4. Spangler, R. H.: Allergy and Epilepsy: Analysis of One Hundred Cases, J. Lab. & Clin. Med. **13**: 41 (Oct.) 1927.
5. Miller, J. L.: Evidence that Idiopathic Epilepsy Is a Sensitization Disease, Am. J. M. Sc. **168**: 635 (Nov.) 1924.
6. Levin, S. J.: Some Allied Manifestations of Allergy in Children, J. Michigan M. Soc. **28**: 857 (Dec.) 1929.

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## EPIDEMIC PAROTITIS COMPLICATING LATE PREGNANCY: REPORT OF A CASE

JOHN H. MOORE, M.D., GRAND FORKS, N. D.

A search of the available literature failed to reveal any instance of mumps complicating late pregnancy. The apparent rarity of this infection in pregnancy and the unusual severity of the symptoms that were present in this case prompted this report.

### REPORT OF CASE

Mrs. R. M., aged 23, white, secundigravida, primipara, had had measles, scarlet fever and pertussis in childhood. Her appendix had been removed. A tonsillectomy had been performed because of mitral stenosis which followed the scarlet fever. During her first labor in 1929 she nearly died with acute heart failure and pulmonary edema. Future pregnancies were interdicted but the prohibition was not heeded.

She came for prenatal care in this second pregnancy in October, 1930. The date of confinement was estimated as June 26, 1931. Until April 10 she did fairly well under close supervision. At that time she was hospitalized because of a mild right-sided pyelitis. In the course of a few days the urine became normal and remained so.

April 20, vomiting began and became persistent; she had recurrent chills, a sudden rise of temperature to 103 F. and a pulse that steadily mounted to 130. Cyanosis was marked. The heart behaved typically as a mitral stenosis does under strain. Consultations with an internist and a urologist failed to reveal any cause for this alarming condition other than that the patient was probably developing an endocarditis.

April 23 the patient appeared to be in collapse. She vomited everything; her skin was cold and clammy; she complained of epigastric tenderness and of exquisite tenderness over the liver. The fetus was in good condition and was estimated to be of seven months' gestation. That evening uterine contractions began and continued at fifteen minute intervals until quieted by pantopon. The temperature pursued a septic course but the pulse remained high. Treatment throughout this prodromal period consisted of dextrose solutions given intravenously, caffeine sodiobenzoate and digalen by hypodermic injection and pantopon as needed to quiet uterine action and to relieve pain.

Swelling of the parotids began, April 24, and on April 25 it was massive. The maximum temperature, 103.4, was reached on the latter date. The same evening the patient went into coma for several hours. April 26, she was able to retain some liquids. The temperature began to subside the following day but no decrease in the parotid swelling was noted until April 29. Up to that time the heart behaved badly. The temperature reached normal for a brief period at about the time the decrease in parotid involvement was noted and the pulse did not subsequently rise above 100.

The blood picture was of interest: April 20, hemoglobin was 80 (Dare); erythrocytes, 4,670,000; leukocytes, 13,425. The differential blood count was: lymphocytes, 15; large mononuclears, 5.5; neutrophils, 73.5; eosinophils, 0.5; myelocytes, 3.5; metamyelocytes, 1; juvenile forms, 1. There was slight anisocytosis. The leukocyte count was 10,300, April 22, and 7,900, April 27, and there was no essential change in the differential blood count. The patient's special nurse subsequently developed mumps and was acutely ill.

May 8, the patient was allowed to leave the hospital. She returned, May 18, because of a slow, steady leakage of liquor

amnii. Fetal heart tones were not heard. May 23, she delivered a still-born male fetus of about eight months' gestation, showing beginning maceration. The puerperium was uneventful.

COMMENT

A case of epidemic parotitis complicating pregnancy is presented in which the prodromal symptoms were especially severe, the parotid involvement excessive and the clinical course so severe as to jeopardize the patient's life.

# Council on Pharmacy and Chemistry

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

**IVYOL-POISON OAK EXTRACT-MULFORD.**—A solution in olive oil of an irritant or vesicant oil extracted from the fresh leaves of poison oak (Rhus diversiloba).

*Actions and Uses.*—Ivyol-poison oak extract is used to relieve the symptoms of the dermatitis produced through contact with poison oak.

*Dosage.*—In cases of average susceptibility, 0.7 cc. intramuscularly at daily intervals for four doses or until relieved. In cases of unusual susceptibility, from 0.2 to 0.35 cc., increased or not as indicated.

Manufactured by H. K. Mulford Company, Philadelphia. U. S. patent 1,559,340 (Oct. 27, 1925; expires, 1942). U. S. trademark applied for.

*Hypo Units Ivyol-Poison Oak Extract:* Collapsible syringe containers, each containing 0.7 cc. of ivyol-poison oak extract.

The fresh leaves of Rhus diversiloba are extracted with purified petroleum benzin. The resulting extract is filtered through paper and decolorized by agitation with fullers' earth. The decolorized extract is concentrated in vacuo to one-tenth its original volume; the concentrated extract is allowed to evaporate spontaneously to dryness; and the residue dissolved in sterile olive oil in the proportion of one part of the extract to 1,000 parts of oil, and 2 per cent of camphor added as a preservative.

**DIPHTHERIA TOXIN-ANTITOXIN MIXTURE** (See New and Nonofficial Remedies, 1931, p. 361).

Lederle Laboratories, Inc., Pearl River, New York.

*Diphtheria Toxin-Antitoxin Mixture, 0.1 L+ (Goat).*—A mixture containing 0.1 L+ dose of diphtheria toxin per cubic centimeter, neutralized with the required amount of diphtheria antitoxin obtained from goats. Marketed in packages of three vials, representing one complete immunization; in packages of three syringes, representing one complete immunization; in packages of thirty vials, representing ten complete immunizations; and in packages of one 30 cc. vial, representing ten complete immunizations.

**NEOCINCHOPHEN** (See New and Nonofficial Remedies, 1931, p. 123).

**Neocinchophen-Squibb.**—A brand of neocinchophen-N. N. R.

Manufactured by E. R. Squibb & Sons, New York. No U. S. patent or trademark.

*Tablets Neocinchophen-Squibb, 5 grains.*

## REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

W. A. PUCKNER, Secretary.

### CARVITIN NOT ACCEPTABLE FOR N. N. R.

Carvitin, according to the information furnished by the Carvitin Products Laboratories, Inc., is a mixture "the active medicinal ingredients consisting of, one (1) grain of vitamin soluble B to the ounce, three (3) grains of pancreatin to the ounce" in a base composed of butter fats 30 per cent, lard 30 per cent, sweet chocolate 15 per cent, bitter chocolate 15 per cent, honey 10 per cent, with glycerin as a preservative. It is stated that the vitamin soluble B in the preparation is a soluble extract made of medicinal yeast "Difco." The trade package of Carvitin contains no information in regard to the composition, other than that it contains vitamin B. In the advertising Carvitin is stated to be "a combination of soluble yeast extract, pancreatin, butter fat and a base rendering to this food tonic a very palatable taste," but no information in regard to the amounts of these ingredients is offered. No information is given on the label or in the advertising in regard to the potency of the yeast extract nor was any evidence submitted to the Council to indicate that the potency of the yeast extract used in the preparation of Carvitin is known or controlled.

Carvitin is claimed to be a "health builder" and "a most Effective Tonic Reconstructive as to Food Value," which "Improves your weight and is Most Valuable in cases of Debility following temporary illness." It is also claimed for Carvitin that "Each ingredient, including the base, has a specific function, and the beneficial values of all the ingredients used in Carvitin are well known to the medical profession"; that it "Increases the appetite, Aids digestion, Helps metabolism, Builds muscle and tissue" and is "the Ideal Tonic." In regard to these extravagant and unwarranted claims it need only be said that the Council has decided not to permit the claim for any medicinal preparation or food that it is a "tonic" and that the medical profession knows that pancreatin is destroyed by the gastric juice and that therefore the oral administration of pancreatin as represented by Carvitin is irrational.

The Council finds Carvitin unacceptable for New and Nonofficial Remedies because it is an unscientific mixture marketed under a name that is not descriptive of its composition, without a declaration of its quantitative composition and without evidence that the potency of the yeast extract contained in it is controlled and because it is sold with claims that are extravagant, misleading and unwarranted.

# Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

### SMACO HYPO-ALLERGIC SKIM MILK (303) (Sterilized Liquid)

*Manufacturer.*—S. M. A. Corporation, Cleveland.

*Description.*—A sterilized almost fat free skim milk made hypo-allergic by prolonged processing.

*Manufacture.*—The milk used in SMACO (303) is collected in accordance with the provisions of the sanitary code of the Cleveland Board of Health. On receipt at the dairy, the milk is pasteurized by the holding system, by which it is uniformly heated to a temperature of between 61 and 65 C. and uniformly maintained at this temperature for thirty minutes. The milk is cooled forthwith to 7 C. or less.

The pasteurized milk is almost completely defatted in a centrifugal cream separator. The skim milk is canned and processed under steam pressure for a prolonged period, after which it is immediately cooled.

*Chemical Composition* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture | 90.9 |
| Total solids | 9.1 |
| Ash | 0.7 |
| Fat (ether extract) | 0.1 |
| Protein (N × 6.38) | 3.2 |
| Lactose (by difference) | 4.9 |

*Calories.*—0.35 per cubic centimeter; 0.33 per gram; 10 per fluid ounce; 9.4 per ounce.

*Micro-Organisms.*—This hypo-allergic milk is sterile according to the "Standard Methods of Bacteriological Analysis of Milk" of the laboratory section of the American Public Health Association.

*Claims of Manufacturer.*—This hypo-allergic skim milk is especially prepared for individuals subject to allergic reactions from usual boiled skim milk or other skim milk preparations. It may be used in regular feeding formulas.

## VAN CAMP'S TOMATO JUICE

*Manufacturer.*—The Van Camp Packing Company, Inc., Indianapolis.

*Description.*—A canned pasteurized tomato juice, seasoned with salt, retaining in large measure the original vitamin content of the tomatoes used.

*Manufacture.*—Field control and inspection of deliveries are exercised to insure the receipt of sound tomatoes, at their height of color and flavor, which are washed in troughs of running water, rolled through reel washers equipped with water sprays for thorough rinsing, sorted and trimmed on continuous belts, and the under-ripe and over-ripe fruit eliminated. The selected, clean tomatoes are sliced and passed through a preheating chamber containing an atmosphere of steam and with controlled temperature conditions. Immediately on leaving the chamber the juice is extracted from the tomatoes in an atmosphere of steam and is passed over a fine screen permitting the passage of a juice of thin consistency retaining solid material essential for providing vitamin A. The juice is homogenized by being forced through small apertures into the juice itself to avoid incorporation of air. The homogenized juice is salted in tanks containing an atmosphere of steam, is vacuumized by exposure of thin sheets to "high vacuum," is immediately filled into enamel lined cans, and is pasteurized for a definite period. Precautions are taken to avoid incorporation of air during the entire operation to minimize vitamin destruction. The factory process is under laboratory control.

*Chemical Composition* (submitted by manufacturer).—

| | |
|---|---|
| Specific gravity 20 C./20 C | 1.03 |
| | per cent |
| Moisture | 93.1 |
| Total solids | 6.9 |
| Total ash | 0.9 |
| Salt (sodium chloride) | 0.5 |
| Fat (ether extract) | 0.1 |
| Protein (N × 6.25) | 1.1 |
| Titratable acidity as citric acid | 0.4 |
| Crude fiber | 0.02 |
| Reducing sugars as dextrose | 3.2 |
| Total carbohydrates (by difference) | 4.4 |
| Alkalinity number (cc. of normal acid to neutralize 1 Gm. of ash | 5.7 |

*Calories.*—0.25 per gram; 7.1 per ounce.

*Vitamins.*—The use of mature tomatoes, the careful factory control, the continuous method of manufacture, the exposure of the fruit juice to an atmosphere of steam only in the factory equipment, and the withdrawal in the "vacuum" treatment of air naturally occurring in the juice assures maximum retention of the natural vitamin content.

*Claims of Manufacturer.*—This tomato juice is a good source of vitamins A and B and an excellent source of vitamin C. It is recommended for infant feeding and for general table use.

## COLE'S REDI-SLICED BREAD

*Manufacturer.*—Cole Baking Company, Bluefield, W. Va.

*Description.*—A sliced white bread made by the sponge dough method.

*Manufacture.*—The sponge dough ingredients, short patent flour of Southwest wheat, water, yeast, and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate, are mixed in a high speed mixer. The sponge dough is fermented for from four to five hours, after which are added flour, water, salt, sucrose, lard and sweetened condensed skimmed milk to make the completed dough, which is cut into pieces of desired weight. The pieces are fermented for a short time, molded into loaf form, panned, fermented, baked for from thirty to thirty-five minutes, cooled, and wrapped in wax-paper.

The factory, equipment and storage rooms for the materials used are kept in strictly sanitary condition.

*Chemical Composition* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture (entire loaf) | 34.3 |
| Ash | 1.2 |
| Fat (direct ether extraction method) | 1.8 |
| Protein (N × 6.25) | 9.4 |
| Crude fiber | 0.2 |
| Carbohydrates other than crude fiber (by difference) | 53.1 |

*Calories.*—2.66 per gram; 75.5 per ounce.

*Claims of Manufacturer.*—A bread of good quality.

## WASHBURN'S GOLD MEDAL FLOUR

*Manufacturer.*—Associate companies of General Mills, Inc., Minneapolis.

*Description.*—A hard spring wheat patent flour designed for commercial bakers' use; packed in sacks.

*Manufacture.*—The manufacture is essentially the same as that for Gold Medal Flour "Kitchen-Tested" (THE JOURNAL, Oct. 3, 1931, p. 1002) excepting that selected hard spring wheat is used. The milling is confined to those associate companies of General Mills having ready access to a wide selection of typical northwestern spring wheats.

The milled flour is bleached and treated to improve the color and baking quality as described for Gold Medal Flour "Kitchen-Tested," although unbleached flour is furnished on request.

The flour is tested by the company's laboratory and experimental bake shop. The laboratory tests aid in controlling the mill operations; the experimental bake shop tests are to assure uniform baking results in commercial baking.

*Chemical Composition* (submitted by manufacturer).—

| | per cent |
|---|---|
| Moisture | 13.0 –14.5 |
| Ash | 0.42– 0.46 |
| Fat (direct ether extraction method) | 0.8 – 1.2 |
| Protein (N × 5.7) | 11.0 –13.0 |
| Crude fiber | 0.4 – 0.5 |
| Carbohydrates other than crude fiber (by difference) | 74.4 –70.3 |

*Calories.*—3.49–3.44 per gram; 99.1–97.7 per ounce.

*Claims of Manufacturer.*—A good quality hard spring wheat patent flour designed to meet the requirements of the baking industry for an economical bread flour with distinct spring wheat characteristics.

## PABST-ETT (PIMENTO VARIETY)

### A Pleasing Combination of "Process" Cheese, Milk Proteins, Milk Sugar, Milk Minerals

*Manufacturer.*—Pabst Corporation, Milwaukee.

*Description.*—A process American cheese containing disodium and trisodium phosphates as emulsifiers; with added canned pimentos, concentrated milk whey and salt.

*Manufacture.*—The manufacture is essentially the same as that for Pabst-ett (A Pleasing Combination of "Process" Cheese, Milk Proteins, Milk Sugar, Milk Minerals) (THE JOURNAL, Oct. 24, 1931, p. 1227) excepting that canned pimentos are added.

*Chemical Composition* (submitted by manufacturer).—

| | (sample as is) per cent | (moisture free basis) per cent |
|---|---|---|
| Moisture | 44.9 | ..... |
| Ash | 6.0 | 10.8 |
| Salt in ash | 1.8 | 3.2 |
| Fat (ether extract) | 24.0 | 43.6 |
| Protein (N × 6.38) | 18.7 | 33.9 |
| Lactose (by difference) | 6.4 | 11.7 |
| Phosphorus (P) | 0.32 | 0.58 |

*Calories.*—3.17 per gram; 90.0 per ounce.

*Vitamins.*—The vitamin content is essentially that of Pabst-ett (A Pleasing Combination of "Process" Cheese, Milk Proteins, Milk Sugar, Milk Minerals).

*Claims of Manufacturer.*—See this section for "Pabst-ett."

## PIXIE STRAINED GREEN BEANS

*Manufacturer.*—Fruit Belt Preserving Company, East Williamson, N. Y.

*Description.*—Canned, sieved green beans containing in large measure the mineral and vitamin content of the raw beans used.

*Manufacture.*—Locally grown green beans are graded, sorted, washed, cut, blanched, canned, sieved and processed by essentially the same procedure as that described for Pixie Strained Carrots (THE JOURNAL, Nov. 14, 1931, p. 1467).

*Chemical Composition* (submitted by manufacturer).—

| | |
|---|---|
| Specific gravity 20 C./20 C | 1.03 |
| | per cent |
| Moisture | 93.2 |
| Total solids | 6.8 |
| Ash | 0.6 |
| Fat (ether extract) | 0.03 |
| Protein (N × 6.25) | 1.3 |
| Crude fiber | 0.6 |
| Carbohydrates other than crude fiber (by difference) | 4.3 |

*Calories.*—0.23 per gram; 6.5 per ounce.

*Vitamins; Micro-Organisms; Claims of Manufacturer.*—See these sections for Pixie Strained Carrots.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 28, 1931

## CRYSTALLINE VITAMIN D

All students of vitamins have long recognized that real progress in our understanding of the physiologic functions and the biologic origins of these indispensable food components depends in no small measure on the possibility of securing the potent substances in chemically pure forms. This applies similarly to the hormones that are so effective in influencing bodily processes and reactions. The crystallization of epinephrine and thyroxine, for example, led to the establishment of their chemical constitution; and this was followed with almost unexpected rapidity by the artificial synthesis of the active compounds.[1] The laboratory has thus triumphed once again over nature by making it possible to replace naturally occurring potent substances by the identical products of human ingenuity.

Commendable progress has lately been made in the domain of vitamin research. Notable is the demonstration that the yellow pigment carotene, now readily obtainable in crystalline form and chemical purity, is transformed into vitamin A in the liver and produces the physiologic effects of vitamin A.[2] American investigators have recently announced the finding of an enzyme, carotenase, in liver tissue capable of converting the pigment into vitamin A.[3] Carotene may therefore at present be regarded as a so-called provitamin. Its remarkable potency is indicated by the repeatedly made demonstration that from 3 to 5 γ, that is, from 0.000003 to 0.000005 mg., suffices to restore to health the standard test animals, rats of 100 Gm. body weight, that show symptoms of vitamin A deficiency. This means that a substance representing less than one part in twenty million of the body substance, administered once a day, serves to insure well being instead of disorder.

Recently even greater progress has been reported for the antirachitic vitamin D. Following logically on the demonstration that irradiation of the crystalline substance ergosterol in suitable ways leads to the production of a substance (viosterol) that is identical in function with what has heretofore been designated as the vitamin D component of cod liver oil and other antirachitic substances comes the report of the isolation of the potent derivative in crystalline form.[4] The attack on the difficulty involved in this performance has been launched simultaneously by Windaus and Linsert at Göttingen in Germany and by a group of biochemists at the National Institute for Medical Research in England. The earliest preparations, though crystalline, now seem to have been contaminated by inert impurities. If, as seems reasonable, it may be assumed that high biologic potency is indicative of relatively great chemical purity, the English investigators have indeed made a noteworthy contribution. They[5] have secured a crystalline material from irradiated ergosterol that has the empiric formula of ergosterol. One milligram of the substance, which they tentatively designate as "calciferol," exhibits an antirachitic potency of approximately 40,000 international vitamin D units. With the preparation of pure, crystalline products of constant potency, as in the case of "calciferol" and carotene, the way is opened for a more rational basis of vitamin assays of our natural food products.

1. The Synthesis of Thyroxine, editorial, J. A. M. A. **88**: 1892 (June 11) 1927.
2. Vitamin A and Carotene, editorial, J. A. M. A. **95**: 937 (Sept. 27) 1930.
3. Olcott, H. S., and McCann, D. C.: The Transformation of Carotene to Vitamin A in Vitro, Science **74**: 414 (Oct. 23) 1931.
4. Askew and others: Proc. Roy. Soc. B. **107**: 76, 1930. Angus and others: Ibid. **108**: 340, 1931. Reerink and van Wijk: Biochem. J. **23**: 1294, 1929; **25**: 1001, 1931. Windaus: Proc. Roy. Soc. B. **108**: 568, 1931. Liebig's Ann. **489**: 252, 1931.
5. Askew, F. A.; Bruce, H. M.; Callow, R. K.; Philpot, J. St. L., and Webster, T. A.: Crystalline Vitamin D, Nature **128**: 758 (Oct. 31) 1931.
6. Moran, F.: Ztschr. f. Immunitätsforsch. u. exper. Therap. **67**: 115, 1930.
7. Hektoen, Ludvig; Fox, H., and Schulhof, Kamil: J. Infect. Dis. **40**: 641 (June) 1927.
8. Hektoen, Ludvig; and Welker, W. H.: J. Infect. Dis. **40**: 706 (June) 1927.

## ORGAN-SPECIFIC LIPOIDS

The recent demonstration[6] by pupils of Prof. Hans Sachs of Heidelberg University of highly specialized lipoids in human tissues, having heretofore unsuspected identities with the lipoids of pathogenic microorganisms and of lower animals, introduces new factors in immunologic reasoning, offers new hypotheses as to the etiology of certain degenerative diseases, and suggests hitherto impossible diagnostic methods. Although the new lipoids are at present solely of theoretical interest, practitioners must familiarize themselves with this growing complexity in clinical chemistry.

Up to about five years ago, but one antigenic component of the human body was known to be of subhuman specificity, the protein of the cystalline lens. An antihuman lens precipitin was known to react in vitro with the lens proteins of all animal species. Since then it has been shown by Hektoen and his co-workers that thyroglobulins also are of approximately the same specificity in man and lower animals,[7] that all fibrinogens possess common or overlapping antigenicities,[8] and that some of the individual blood proteins are not of full human specificity.

A new direction was given to the study of such common or overlapping specificities by the Landsteiner [9] technic. Briefly stated, Landsteiner found that, while lipoids in themselves rarely stimulate the formation of specific antibodies when injected into laboratory animals, they will cause the appearance or synthesis of circulating antibodies if injected in conjugation with or adsorbed on alien proteins. The resulting antiserums possess both antiprotein and antilipoidal functions. With such an antiserum the pure lipoid can be identified by the deviation of complement reaction. Applying this technic to the study of extractable lipoids of human and animal tissues, the Heidelberg research group found that such lipoids can be divided into three immunologic groups. First, there is a relatively large group of nonspecific lipoids, having no demonstrable relationship to tissues, organs or animal species. Immunization of a rabbit with such a "universal" lipoid (plus a protein "carrier") leads to the production of a "universal" lipoidal antiserum, or artificial Wassermann reaction. Second, they report a number of species-specific lipoids, found in varying amounts in all tissues and organs of the same animal species but absent from the tissues of other species. Third, they report a small number of organ-specific lipoids, found only in a single tissue, organ or group of organs, but being present in such sites irrespective of the species tested. As an example, the extractable lipoids of the human brain are apparently lipoids common to all lower brains. The kidney and liver lipoids also are organ-specific, though possessing minor species-specific characteristics.

Recognition of organ-specific tissue components will necessitate revision in conventional immunologic reasoning. It gives, for example, for the first time a concrete biochemical basis for Rosenow's [10] alleged elective localization of bacteria in certain organs, irrespective of animal species. Specific allergies in one organ, with normal or immune reactions in other parts of the same animal body, and Cook and Spain's [11] alleged organ-specific antiserums, are no longer theoretical impossibilities. Witebsky's [12] alleged demonstration of brain-specific lipoids in pure cultures of Spirochaeta pallida suggests a heretofore unpostulated method of autointoxication, an autogenous cytotoxin specifically destructive to brain lipoids. Such a conceivable though still unproved etiology is in line with Brickner's [13] recently demonstrated "myelinolysin" in the serum of patients with multiple sclerosis. Witebsky's alleged demonstration of carcinoma-specific lipoids gives renewed hope of some future successful serologic test for malignant conditions.

9. Landsteiner, K., and Simms, S.: Production of Heterogenetic Antibodies with Mixtures of Binding Part of Antigen and Protein, J. Exper. Med. **38**: 127 (Aug.) 1923.
10. Rosenow, E. D.: The Newer Knowledge of Bacteriology and Immunology, University of Chicago Press, 1928, chap. 43, p. 576.
11. Cooke, R. A., and Spain, W. C.: Studies in Hypersensitiveness: Comparative Study of Antibodies Occurring in Anaphylaxis, Serum Disease and Naturally Sensitive Man, J. Immunol. **17**: 295 (Oct.) 1929.
12. Witebsky, E.: Ztschr. f. Immunitätsforsch. u. exper. Therap. **62**: 35, 1929.
13. Brickner, R. M.: Pathogenesis of Multiple Sclerosis, Arch. Neurol. & Psychiat. **23**: 715 (April) 1930.

## THE DIFFUSIBILITY OF PLASMA PROTEINS

In considering the elimination of protein into the urine, as it takes place in various types of kidney disorder, at least two possibilities present themselves. One of these postulates that the escape of the protein is attributable to some sort of renal damage; the other concerns the implication that somehow the protein of the blood plasma has been changed, so that its passage through the kidney membranes ensues more readily. The mechanism of albuminuria is involved in this uncertainty.

Ordinarily the protein in the urine is derived almost entirely from the proteins of the blood plasma, serum albumin passing through the renal barrier in larger quantities than serum globulin. How do they pass? A few years ago Andrews, Thomas and Welker [1] of Chicago came to the conclusion that the urine of nephritic persons contains, besides the normal blood proteins, a relatively nontoxic peptone combined with or adsorbed by serum proteins, and also a highly toxic blood protein so highly dispersed in solution as to pass readily through a collodion membrane. The Chicago investigators ventured to believe that albuminuria may be looked on as a protective mechanism on the part of the body to carry poisons from the seat of origin to the outside by the well known mechanism of neutralization by combination with innocuous substances. These substances may represent normal stages in nitrogen metabolism, and the pathologic factor lies in their making their way into the blood stream, as already suggested. Another interesting possibility to be considered, they add, is that nephritis is comparable to diabetes in the sense that protein metabolism is interfered with by some means, so that oxidation is incomplete and the process stops at a state wherein the products of nitrogenous metabolism are toxic and are eliminated by the mechanism previously described. This is a bold hypothesis; for, as Gaebler [2] has recently pointed out, the excretion of protein during nephritis is commonly ascribed to changes that have taken place in the kidney, rather than to changes in the proteins or other constituents of plasma.

Gaebler has undertaken simple dialysis experiments with membranes affected in various ways so as to alter their permeability for protein. The comparisons were made with blood plasma from healthy persons and from patients with and without albuminuria. There was no evidence obtainable in this way that proteinuria is due to an increase in the diffusibility of plasma proteins or to the presence of substances increasing the permeability of artificial membranes. This does not necessarily negate the conflicting views but it leaves the problem of the genesis of protein excretion by the kidney as obscure as ever.

1. Andrews, Edmund; Thomas, W. A., and Welker, W. F.: Albuminuria in the Mechanism of Detoxification, Arch. Int. Med. **43**: 139 (Jan.) 1929.
2. Gaebler, O. H.: Diffusibility of the Proteins of Normal and Pathological Plasma, J. Biol. Chem. **93**: 467 (Oct.) 1931.

# Current Comment

## SALIVARY DIGESTION OF STARCH, 1831

The present year may well be said to mark the hundredth anniversary of the beginning of the study of enzyme activity in body fluids. Only a few years after the discovery of hydrochloric acid in the gastric juice, and at about the same time that William Beaumont was performing his now famous gastric experiments with Alexis St. Martin, E. F. Leuchs [1] clearly demonstrated the digestive functions of saliva. Even today it is of interest to read again the brief account of this noteworthy contribution to physiology. Thus Leuchs wrote:

> Tiedemann and Gmelin found some sugar in the gastric contents of a goose fed only with starch powder until death. Because saliva is very similar to gastric juice, I decided to investigate its digestive functions. Accordingly, cooked starch was allowed to stand with some added saliva in a warm place and, after a short time, the thick mass became fluid and appreciably sweet. Raw starch was apparently altered only to the extent that it had been previously treated with warm water to form a paste. This explains why all farinaceous foods, through cooking or baking, become readily acted upon.

Since this first demonstration of the inability of saliva to digest raw starch, similar experiments have been included in many laboratory courses in physiologic chemistry. Leuchs also showed that acacia and lactose were not affected by saliva. He continued:

> The foregoing experiments offer a ready explanation for the fact that the Indians in a section of South America, who cultivate a variety of maize from which they prepare a kind of beer, first chew the grain, whereby it is supposed to become better. In ancient Greece, also, the wetnurses frequently chewed the food for the children to render it more digestible.

A thoroughly practical point of view marks the concluding sentence, in which the author points out the possibility of using the saliva and gastric juice of slaughtered animals in the treatment of human digestive ailments. Later investigations have shown such therapeusis to be of limited value. Nevertheless, the fundamental importance of Leuch's contribution to knowledge of the chemistry of digestion is quite evident. His work may be considered one of the foundations of the fruitful researches that have resulted in this field during the years since 1831.

## THE EFFECTS OF COMPLETE PANCREATIC DRAINAGE

Attention has been directed recently and more impressively than ever before to what the loss of some of the alimentary secretions may mean for the welfare of the body. Persistent vomiting, with the removal of considerable quantities of gastric secretion, may bring about untoward results, as does a persistent diarrheal loss of intestinal fluid. Two features of such experiences are especially stressed; namely, the loss of water and the loss of chloride. Anhydremia and disturbances of the inorganic balances of the blood constituents are serious symptoms formerly quite unsuspected. The restoration of fluid and chloride to the body often insures relief and recovery. Of late there have been accumulating indications [1] that the loss of pancreatic juice for any length of time may be incompatible with life, whereas the loss of bile and duodenal secretion is without lethal effect. Observations of McCaughan [2] at the Mayo Foundation emphasize anew the importance of the water and chloride stability of the organism. The removal of the pancreas is not necessarily fatal so long as insulin is supplied to replace the missing essential hormone; but, when all the pancreatic juice is drained away from the body, death is likely to ensue promptly. The loss of the juice may conceivably represent losses of protein, water and salts. Subtotal drainage of pancreatic juice is generally without lethal effect. Total drainage by fistula produces characteristic metabolic alterations. Anhydremia is to be emphasized particularly. Chemical changes in the blood are chiefly marked by modern elevations of urea preceding death. Apparently, health can be restored by oral administration of whole pancreatic juice. The administration intravenously of physiologic solution of sodium chloride daily during the period of total drainage will prolong life and maintain the blood in normal condition. McCaughan points out that the essential cause of early death following total drainage of pancreatic juice is not entirely clear. In general, the loss of salts, water and proteins by way of the pancreatic juice and gastric vomitus must be an important factor. The comparatively slight disturbances in the blood on chemical examination and the improvement in the condition of a moribund animal after oral administration of whole pancreatic juice leave much to be explained. Modern research has stressed the importance, however, of averting anhydremia under any of the increasingly recognized circumstances in which it may arise.

## MEDICAL EDUCATION IN MISSISSIPPI

Repudiation of the Bilbo administration, which so nearly wrecked the educational institutions of Mississippi, occurred recently when Martin Sennett Conner was overwhelmingly elected governor. The standing of the medical school of the university was threatened in 1930 when the dean and the entire faculty were ousted and others put in their places. A partial restitution took place when the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, and other organizations interested in higher education, the united medical profession of Mississippi and an aroused public opinion protested against such high-handed and destructive tactics. Most of the faculty members were recalled and Dr. P. L. Mull, professor of anatomy, was named acting dean. Professors were graciously lent to the school by Vanderbilt University and the University of Tennessee. The medical school

1. Leuchs, E. F.: Wirkung des Speichels auf Stärke, Ann. der Physik. u. Chemie (Poggendorff's) **22**: 623, 1831; Ueber die Versuchung der Beeinflussung des Stärkemehls durch Speichel, Arch. f. Chem. u. Meteorol. (Kastner's) **3**: 105, 1831.

1. Walters, Waltman; and Bollman, J. L.: Experimental Acute Gastric Fistula, Arch. Surg. **13**: 578 (Oct.) 1926; The Toxemia of Duodenal Fistula, J. A. M. A. **89**: 1847 (Nov. 26) 1927.

2. McCaughan, J. M.: Experimental Studies on the External Secretion of the Pancreas with Special Reference to the Effect of Its Complete Loss by Permanent Pancreatic Fistula: I. The Coincident Changes in the Chemistry of the Blood; II. The Mechanism of Death, Am. J. Physiol. **97**: 459 (June) 1931.

was nursed along through this trying period, but it is now evident that the people of the state of Mississippi were eagerly awaiting the time when they could administer a death blow to further officious interference with their schools. The new governor will no doubt be constructive rather than destructive in educational matters.

## Association News

### ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES HELD IN CHICAGO, NOV. 12 AND 13, 1931

The Board of Trustees met in Chicago on Thursday and Friday, November 12 and 13. Part of the time on Friday and Saturday was devoted to attendance at the meeting of the state secretaries, in the headquarters building.

#### ELECTION OF DR. WILLIAM D. CUTTER TO SECRETARYSHIP OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

On the nomination of the Council on Medical Education and Hospitals, Dr. William D. Cutter, formerly dean of the University of Southern California, was elected secretary of the Council to succeed Dr. Nathan P. Colwell, who has been retired on account of indisposition.

#### EXHIBIT AT CENTURY OF PROGRESS

After giving due consideration to an invitation from the board of directors of the Century of Progress, the Board of Trustees voted in favor of making an exhibit to demonstrate the progress in medical education, public instruction about medicine, and progress in medical practice, believing that the public will be interested in, and ought to be informed on, these phases of the Association's activities.

#### QUARTERLY CUMULATIVE INDEX MEDICUS

Since the assistance of outside agencies in the preparation and support of the *Quarterly Cumulative Index Medicus* will be discontinued, December 31, it was deemed advisable to appoint a new staff to conduct the *Index*. This staff will henceforth comprise Dr. Morris Fishbein, editor of THE JOURNAL and of *Hygeia;* Miss Marjorie Hutchins, Librarian, and Miss Magdelene Freyder, Assistant Librarian.

#### DR. JOHN F. BARNHILL ELECTED MEMBER OF EDITORIAL BOARD OF ARCHIVES OF OTOLARYNGOLOGY

Dr. John F. Barnhill, Miami Beach, Fla., was elected to succeed Dr. Robert C. Lynch (deceased) on the editorial board of the *Archives of Otolaryngology*.

#### PROVISION OF BLANKS TO THE NATIONAL CONGRESS OF PARENTS AND TEACHERS

The provision of blanks for the examination of school children to the National Congress of Parents and Teachers for the summer round-up campaign was ordered continued.

#### CHAIRMAN OF LOCAL COMMITTEE ON ARRANGEMENTS

The Board of Trustees approved the nomination of Dr. W. H. Seemann by the Orleans Parish Medical Society for chairman of the Local Committee on Arrangements for the New Orleans Session of the Association.

#### EMPLOYMENT OF DR. WILLIAM W. BAUER AS ASSISTANT SECRETARY OF BUREAU OF HEALTH AND PUBLIC INSTRUCTION

The employment of Dr. William W. Bauer of Racine, Wis., as assistant secretary of the Bureau of Health and Public Instruction, to succeed Dr. Rosco G. Leland, who was elected to the secretaryship of the Bureau of Economics at the February meeting of the Board, was approved. Dr. Bauer will take up his duties about the first of the year.

#### CONGRATULATORY MESSAGE TO EVE MEMORIAL COMMITTEE

On instructions from the Board, the Chairman and another Trustee sent congratulations to the chairman of the Eve Memorial Committee on the memorial exercises being held in Augusta, Ga., to Dr. Paul Fitzsimmons Eve, who served as President of the American Medical Association in 1857, and whose services in medical education and in relieving the wounded in wars in Poland and in this country, as well as his contributions to medical periodical literature and his distinction in medical science, well warrant the recognition that was being extended to his memory.

Various other matters were considered: some required no action; others will be acted on at a later meeting.

### MEDICAL BROADCAST FOR THE WEEK

**American Medical Association Health Talks**

The American Medical Association broadcasts at 11:15 a. m. on Saturday over Station WBBM (770 kilocycles or 389.4 meters).

The program for the week is as follows:

December 5. Rickets.

Five Minute Health Talks may be heard over Station WBBM of the Columbia Broadcasting System at 2:25 p. m. on Monday, Wednesday and Friday.

The program for the week is as follows:

November 30. Everybody's Business.
December 2. School Days Should Be Health Days.
December 4. Cooking for the Prospective Mother.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

### CALIFORNIA

**Clinical Prize Contest.**—The California Medical Association, through a simplification of the rules which govern the Clinical and Research Prize Contest, has made it possible for a member of the state society to submit the same manuscript to section officers for place on the annual program and to the prize committee for entry in the prize contest. All papers must be received by the secretary, Dr. Emma W. Pope, room 2004, 450 Sutter Street, San Francisco, before February 15. Any member of the state association is eligible to compete. Inquiries relative to the contest should be addressed to the chairman of the committee, Dr. George Dock, 94 North Madison Avenue, Pasadena.

**Society News.**—The Los Angeles Society of Neurology and Psychiatry was addressed, November 25, by Drs. John B. Doyle on "Narcolepsy—Results of Treatment with Ephedrine Sulphate," and Samuel V. Abraham, "Myasthenia Gravis—New Diagnostic Eye Findings with Possible Pathologic Significance."——Dr. Henry Douglas Eaton, among others, spoke before the Medical Symposium Society of Los Angeles, November 25, on "Epilepsy."——The Los Angeles Surgical Society was addressed, November 20, by Drs. Charles T. Sturgeon on "Diverticula of Esophagus"; Clarence A. Johnson, "Benign Neoplasms of the Stomach," and William H. Daniel, "Failure of X-Ray Diagnosis of Tumors of the Rectum."——Dr. William W. Cross, Jr., Oakland, addressed the Alameda County Medical Association, November 16, among others, on "Venomous Reptiles and the Specific Treatment of Snake Bite," and Dr. Paul P. E. Michael, "Tuberculosis of Meckel's Diverticulum."

### CONNECTICUT

**State Health Department in Permanent Quarters.**—With the completion of the south wing of the new State Office Building, all bureaus of the state department of health, Hartford, are now established in permanent headquarters. The entire third floor of this wing as well as a section of the second and fourth floors are set aside for the offices of the

department. The bureau of laboratories will remain at 247 Pearl Street.

**Society News.** — The semiannual meeting of the Tolland County Medical Association was addressed, October 20, among others, by Drs. Millard Knowlton, Hartford, on "Infantile Paralysis" and "Undulant Fever," and Maurice M. Pike, Hartford, "Care of Paralyzed Patients."——The one hundred and fortieth semiannual meeting of the Hartford County Medical Association was addressed, October 27, among others, by Drs. Vincent F. Mendillo, New Britain, on "Trichinosis"; Stanley H. Osborn, Hartford, state health commissioner, "Anterior Poliomyelitis: The Recent Epidemic in Connecticut," and Bradley L. Coley, New York, "Hernia—Surgical and Nonsurgical Treatment."——Dr. Louis E. Phaneuf, Boston, addressed the Bridgeport Medical Association, October 6, on "Uterine Hemorrhages with Special Reference to Uterine Cancer."

## GEORGIA

**Personal.**—Dr. Jesse L. Howell, Atlanta, was recently appointed a member of the state board of medical examiners to succeed Dr. Alfred F. White, Flovilla.——Dr. Thomas H. Johnston, Athens, has resigned as health commissioner of Athens and Clarke County.——Dr. Thomas R. Ponton, Augusta, has been appointed superintendent of University Hospital, Atlanta.

**Society News.**—Dr. Joseph Yampolsky, Atlanta, addressed the Fulton County Medical Society, November 5, on "The Southern White Clinic Child—A Study of 500 Cases with Special Reference to Diarrhea and Otitis Media." Dr. Emmett D. Colvin, Atlanta, gave "An Analysis of the Abdominal Cesarean Sections Performed in Atlanta from 1925 to 1930" before the society, November 19; Dr. Stuart H. Shippey talked on "The Clinical Significance of Achlorhydria."——Dr. Roy R. Kracke, Emory University, will address the Fulton County Pediatric Society, December 10, on "Present Status of the Filtrable Viruses"; Dr. William L. Funkhouser, Atlanta, will present a case report on encephalitis following smallpox vaccination.

## ILLINOIS

**Society News.**—Dr. Clifford J. Barborka, Rochester, Minn., addressed the Peoria City Medical Society, November 13, on "Relation of Diet to Health and Disease."——A symposium on salpingitis was conducted before the Adams County Medical Society, November 9, by Drs. Frank Cohen, Earl L. Caddick and Henry J. Jurgens, all of Quincy, and John F. Ross, Golden. —— The Bureau County Medical Society was addressed, November 10, by Drs. Leon Unger and Edward A. Oliver, Chicago, on "Allergy" and "Practical Points in Dermatology," respectively. —— The Pike County Medical Society was addressed in Barry, October 22, among others, by Drs. Charles D. Center, Quincy, on "The Child"; Dudley T. Dawson, Danville, "Duties and Responsibilities of the Psychiatrist to His Community." —— The Tri-County Medical Society was addressed at Monmouth, October 15, by Drs. Gilbert H. Marquardt and Lowell D. Snorf, Chicago, among others, on diagnosis and treatment of vascular pains and edema of the legs and "Treatment of Peptic Ulcer and Its Complications," respectively; Dr. Harold O. Jones, Chicago, showed a motion picture with sound on "Treatment of Pelvic Infections."—— The Madison County Medical Society was addressed, November 6, by Dr. Leland B. Alford, St. Louis, on "Treatment of the Common Neuroses."——The members of the Lake County Medical Society were the guests of the medical staff of the U. S. Naval Hospital at Great Lakes, November 4; Lieut. Comdr. Morton D. Willcutts spoke on "Local Anesthesia."—— Dr. John E. Reed, Benton, was elected president of the Southern Illinois Medical Association at its annual meeting in Olney, November 5-6. The next session will be held in Carbondale.

### Chicago

**Dr. Long Resigns to Go to Phipps Institute.** — The resignation of Dr. Esmond R. Long as professor of pathology at the Graduate School of Medicine of the Division of Biological Sciences, University of Chicago, has been announced; it will become effective, July 1, 1932. Dr. Long has been appointed director of laboratories of the Phipps Institute of the University of Pennsylvania, Philadelphia. Dr. Long was assistant in pathology at the University of Chicago, 1911-1913; he was assistant at the Desert Laboratory of the Carnegie Institution of Washington, Tucson, Ariz., 1914-1915. He has been professor of pathology at Chicago since 1928. He received the bachelor's degree in 1911, doctor of philosophy in 1919 and the medical degree in 1926, all from the University of Chicago.

**Reorganization of University Clinics.**—By action of the board of trustees, November 12, University Clinics, the University of Chicago, have been incorporated within the division of biological sciences, and placed under the administration of the dean of the division. As a part of the reorganization, Dr. Franklin C. McLean has resigned as associate dean of the division but will remain in the office of the dean as director of University Clinics. He also retains his professorship in the department of medicine, but with the appointment of Dr. Oswald H. Robertson as acting chairman of that department he has withdrawn from the administrative affairs of the department. The university also announced the appointment of Dr. Frederick W. Schlutz as the first Richard T. Crane professor of pediatrics. This professorship was endowed in 1916 by the Crane family, but no appointment has been made heretofore, pending the organization of the clinical departments on the campus.

**Society News.** — The Chicago Society of Allergy was addressed, November 16, by Drs. Benjamin Z. Rappaport and Tell Nelson on "Effect of Air Filtration on Pollen Hay Fever and Asthma," and C. E. Barrett, "Atmospheric Pollen Studies." ——Max Poser, Ph.D., Rochester, N. Y., addressed the Chicago Ophthalmological Society, November 16, on "Importance of Elimination of Astigmatism in Oblique Pencils and the Character of the Various Types of Corrected Lenses Pertaining to This Subject," and Dr. Theodore M. Shapira, "Heteroplastic Ossification. A Report of Two Cases of Bone Formation in the Choroid."——A joint meeting of the Chicago Heart Association and the Chicago Medical Society, November 18, was addressed, among others, by Dr. Harrold A. Bachmann on "Rheumatic Endocarditis in Children."——A symposium on prediction methods in criminology featured the meeting of the Chicago Academy of Criminology, November 12; the speakers were Ernest W. Burgess, Ph.D., and Clark A. Tibbits of the University of Chicago, and Dr. John A. Larson of the Institute for Juvenile Research.——The Chicago Gynecological Society was addressed, November 20, by Dr. William J. Dieckmann, St. Louis, on "Blood Volume Changes in Eclampsia," and Dr. Irving F. Stein and Miss Elizabeth Cope, "Trichomonas Vaginalis."——Dr. Clarence M. Hincks, director, National Committee for Mental Hygiene, will address the annual meeting of the Illinois Society for Mental Hygiene, December 4, at the Chicago Woman's Club.

## INDIANA

**Hospital News.**—At a conference of superintendents of the Methodist hospitals in the Indiana and western Ohio area of the Methodist Episcopal Church in Indianapolis recently, it was stated that more than $1,000,000 had been expended in the care of free patients by these hospitals last year, and that more than 41,000 patients had been cared for during the same period.

**Medical Care for the Unemployed.**—According to newspaper reports, the medical service committee of Governor Leslie's unemployment relief commission is conducting a survey of methods of providing medical care for the state's poor sick. This work is being done to determine the manner in which the township trustees and the medical profession in each locality are handling poor relief work, the costs of service, the method of handling hospital cases and the amount of free work done by the medical profession in each county. Dr. William H. Kennedy, Indianapolis, is chairman of the medical service committee. The St. Joseph County Medical Society has established a twenty-four hour medical service for the sick in cooperation with the new Central Service Bureau, South Bend, the purpose of which is to act as a clearing house for medical charity. It is planned to have six physicians on the physician's exchange for two weeks' service; a new group will be chosen every two weeks. Complete files will be kept of all cases and a thorough investigation will be made to select the true charity cases.

**Society News.** — The Indianapolis Medical Society was addressed, November 10, by Drs. Murray N. Hadley and Harold M. Trusler on "Wound Healing"; November 17, by Drs. Ralph S. Chappel on "A Program for the Prevention of Deafness," and Alfred S. Jaeger, "Full Term Abdominal Pregnancy"; and, November 24, by Drs. Charles E. Wooding and Howard L. Stitt, Cincinnati, on bronchial irrigation. ——Dr. Russell M. Wilder, Chicago, addressed the Indianapolis Academy of Medicine and Surgery, November 19, on "Obesity." ——Dr. Kendall Emerson, New York, addressed the Marion County Tuberculosis Association, November 19, on the effect of economic depression on the nation-wide struggle to control tuberculosis and kindred diseases.——Dr. Robert M. Moore, Indianapolis, addressed the Howard County Medical Society, October 2, on "Relation of Heart Conditions to Surgery."—— Dr. Charles A. Elliott, Chicago, addressed the Tippecanoe County Medical Society at La Fayette, November 12, on "Circulatory Failure in Acute Infectious Diseases."——Drs. Jewett V. Reed and LaRue D. Carter, Indianapolis, addressed the

Montgomery County Medical Society at Crawfordsville, October 29, on "Head Injuries."——Dr. Arthur G. Miller, Hobart, addressed the Porter County Medical Association, October 27, in Valparaiso on "The Aschheim-Zondek Test for Early Pregnancy" with report of 150 cases, and Dr. Roscoe L. Sensenich, South Bend, "Simple Measures in the Management of Common Digestive Disturbances."

## IOWA

**Personal.**—Dr. Ewen M. MacEwen, professor of anatomy, University of Iowa College of Medicine, Iowa City, has been appointed head of the department to succeed the late Dr. Henry J. Prentiss.

**Graduate Courses.**—The Speakers' Bureau of the Iowa State Medical Society recently conducted a course on cardiovascular diseases and one on surgery for the general practitioner in Leon, Red Oak, Sioux City, Sheldon and Boone. The courses extended from September 14 to November 16 with a registration of about 180. This was the second series of courses offered by the bureau, the first having been given in December, 1930. The University of Iowa College of Medicine outlines the courses that can be best given, and the bureau sponsors them throughout the state. Two courses are given at the same time; a circuit of five centers is worked up and the courses are given the same night of the week in each center. The fees for the two twenty-hour courses are $20, which pays the traveling expenses of the lecturers and other incidentals to the courses. The Speakers' Bureau also provides lecturers for programs of county medical societies and lay organizations. In October, it sent forty-five speakers to thirty-one meetings.

**Society News.**—Dr. Nicholas Schilling, New Hampton, addressed the Allamakee County Medical Society recently, among others, on "Indications for Cesarean Section."——The Johnson County Medical Society was addressed, October 7, by Avery E. Lambert, Ph.D., Iowa City, and Dr. Harry P. Lee on "Histogenesis of the Red Blood Cells" and "Intravenous Urography," respectively.——Dr. Howard A. Lanpher, Des Moines, state epidemiologist, addressed the Lucas County Medical Society in Chariton, October 6, on methods of combating the typhoid epidemic, which had taken on unusual proportions in that locality during the last three months.——The Washington County Medical Society was addressed, October 6, by Drs. Morgan J. Foster, Cedar Rapids, on "Intussusception," and William F. Mengert, Iowa City, "Obstetrical Problems."——Dr. James A. Evans, La Crosse, Wis., addressed the Webster County Medical Society, October 13, on "Gastric Ulcer—Benign and Malignant."——The Linn County Medical Society will be addressed, December 10, by Dr. Paul A. O'Leary, Rochester, Minn., on "Primary and Secondary Stages of Syphilis and Treatment," and by Dr. Callistus H. Stark, Cedar Rapids, on "Spinal Anesthesia."

## MARYLAND

**Physicians Address Women's League.**—At a meeting of the Maryland League of Women Voters, October 27-28, at the Southern Hotel, Baltimore, the following addresses on medical subjects were presented: Allon Peebles, Ph.D., of the Committee on the Costs of Medical Care, "Problems of Medical Service—The Public's Point of View"; Dr. James M. H. Rowland, president, Medical and Chirurgical Faculty of Maryland, and dean, University of Maryland School of Medicine, "Point of View of the Physician," and Dr. Allen W. Freeman of the School of Hygiene and Public Health, Johns Hopkins University, "Public Health in Its Relation to the Private Practice of Medicine." A round table discussion on a state program for dependent old age was conducted, October 28; Dr. Robert W. B. Mayo, medical director, Home for Incurables, spoke on "The Chronic and Incurable," and Dr. George H. Preston, state commissioner of mental hygiene, "The Problem of Senility."

## MASSACHUSETTS

**Dr. Sigerist to Deliver Sedgwick Lecture.**—Dr. Henry E. Sigerist of the Institute for the History of Medicine, University of Leipzig, Germany, will give the ninth William Thompson Sedgwick Memorial Lecture in the Massachusetts Institute of Technology, Cambridge, December 1; his subject will be "The Philosophy of Hygiene." The lectureship was established to commemorate the services of William Thompson Sedgwick to the cause of biology and public health. It is given annually at the institute under the auspices of the department of biology, which was created by Sedgwick.

**Society News.**—The first of a series of lectures on the history of medicine at Harvard University Medical School will be given, November 30, by Dr. Henry E. Sigerist, professor in the history of medicine, University of Leipzig; his subject will be "Civilization and Disease."——Dr. Reginald Fitz, Boston, addressed the South End Medical Club, November 17, on "Recent Advances in Diabetes."——Sir Wilfred T. Grenfell addressed the Harvard Medical Society, November 10, on "Medical Practice in the Labrador," and Dr. Alexander Forbes, Milton, spoke on "An Expedition to Northern Labrador."

## MICHIGAN

**School for the Handicapped Dedicated.**—The Ann J. Kellogg School was formally dedicated in Battle Creek, November 24. Presentation of the building was made by Dr. Stuart Pritchard, director, W. K. Kellogg Foundation, and the speech of acceptance was made by W. G. Coburn, superintendent of schools. The guest speakers included Hon. Wilber M. Brucker, governor of Michigan; Alexander G. Ruthven, Ph.D., president, University of Michigan, Ann Arbor; Harry E. Barnard, Ph.D., director, White House Conference on Child Health and Protection; Hon. Webster H. Pearce, superintendent of public instruction, and Charles Scott Berry, Ph.D., director of special education, Ohio State University. The Ann J. Kellogg School is a special institution designed and equipped to meet the individual needs of all types of children, and its program provides for normal free association of the handicapped with the normal children. The school's objectives embody the aims set forth by the recent White House Conference on Child Health and Protection. The state contributes financial aid for the education of certain types of handicapped children, and the W. K. Kellogg Foundation furnishes professional service and helps finance additional expenses. The school was made possible by the board of education and W. K. Kellogg. It is named and dedicated in memory of Mr. Kellogg's mother, who was a pioneer teacher in Michigan.

**Society News.**—Dr. Robert H. Haskell, Northville, addressed the Wayne County Medical Society, November 17, on "Training the Mentally Retarded Child in Wayne County." The society held its annual feather party, November 24. The Detroit Institute of Adult Education is sponsoring seminars on phases of research by members of the Wayne County Medical Society, entitled "Interpretation of Modern Medical Literature." The first series on "Glands and Their Functions," given by Dr. Carleton J. Marinus, opened, November 13, with a talk on the pituitary gland; November 20, Dr. Marinus spoke on the thyroid gland, and, November 27, on the sex glands; he will give a summary of the endocrine glands, December 4.——Dr. Henry S. K. Willis, Northville, gave the second lecture of the series on tuberculosis at the Herman Kiefer Hospital, Detroit, November 18.——Dr. John T. Murphy, Toledo, was elected president of the Detroit Roentgen Ray and Radium Society, November 5; Dr. Clyde K. Hasley was elected vice president, and Dr. Eldwin R. Witwer, secretary. Dr. William A. Evans entertained the society and guests at a turkey dinner; he also spoke on "Vertebral Body Abnormalities."——Dr. William H. Marshall, Flint, addressed the Kalamazoo Academy of Medicine, November 17, on "Coronary Occlusion."——Dr. Frank H. Bartlett, Jr., Muskegon, addressed the Ottawa County Medical Society, November 10, on "Diagnosis of Tuberculosis."

## NEW YORK

**Society News.**—The second district branch of the Medical Society of the State of New York held its twenty-fifth annual meeting, November 19, in Brooklyn. At the afternoon session there were discussions of the poliomyelitis epidemic, stressing after-care; of pneumonia, health examinations and the treatment of goiter. At the annual banquet a discussion was held on the topic "What About Government Medicine?" with the following speakers: Dr. William D. Johnson, Batavia, president of the state medical society; Dr. Livingston Farrand, president of Cornell University, Ithaca; Dr. Allan J. McLaughlin of the U. S. Public Health Service, and Michael M. Davis, Ph.D., director of medical services, Julius Rosenwald Fund, Chicago.

**Health at Utica.**—Telegraphic reports to the U. S. Department of Commerce from eighty-two cities with a population of 36 million, for the week ended November 14, indicate that the highest mortality rate (18.9) appears for Utica, and the rate for the group of cities as a whole, 11.1. The mortality rate for Utica for the corresponding period last year was 12.8 and for the group of cities, 12.1. The annual rate for eighty-two cities for the forty-six weeks of 1931 was 11.9 and the same rate appears for the corresponding weeks of 1930. Caution should be used in the interpretation of weekly figures, as they

fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

### New York City

**Research Hospital Seeks Patients.**—The Hospital of the Rockefeller Institute for Medical Research announces that patients with certain diseases now under investigation at the institute will be admitted to the extent of the hospital facilities. These diseases are chickenpox, measles, rheumatic fever, cardiac disease, nephritis and acute infection of the respiratory tract, including acute lobar pneumonia. Physicians are requested to communicate with the hospital before sending patients.

**Courses in Psychoanalysis.**—The New York Psychoanalytic Institute began operation, October 1, under the direction of Dr. Sandor Rado of the Berlin Psychoanalytic Institute. Elementary and advanced seminars for practicing psychoanalysts are offered and future plans include seminars for social service workers, introductory lectures for physicians and lectures for the public. Inquiries concerning these courses should be addressed to Dr. Monroe A. Meyer, executive director, 324 West Eighty-Sixth Street.

**Lectures in Brooklyn.**—Friday afternoon lectures in the auditorium of the Medical Society of the County of Kings will be as follows for the next three weeks:

December 4, "Treatment of Arthritis," Dr. Ralph Pemberton, Philadelphia.
December 11, "Cancer of the Rectum and Colon," Dr. Howard M. Clute, Boston.
December 18, "The Doctor, His Legal Rights and Obligations," Dr. George I. Swetlow, Brooklyn.

Dr. Charles P. Hutchins, Syracuse, gave the address for November 20, on "Getting the Injured Back to Work," and Dr. Howard B. Sprague, Boston, that for November 27, on "Treatment of Angina Pectoris and Coronary Occlusion."

**Society News.**—Dr. Harry Samuel Eagle, Baltimore, among others, addressed the New York Pathological Society, November 12, on "Precipitation Tests for Syphilis."——Dr. Louis Berman addressed the Society of Medical Jurisprudence, November 9, on "Crime and the Endocrine Glands."——Dr. Edward J. Donovan addressed the New York Surgical Society, November 11, on "Congenital Hypertrophic Pyloric Stenosis."——Drs. John M. T. Finney and Julius Friedenwald, Baltimore, addressed the Baltimore Medical Club of New York, November 12, on "Everyday Problems in the Etiology, Diagnosis and Treatment of Gastroduodenal Ulcers" and "Modern Treatment of Digestive Disturbances," respectively.——Dr. H. Burton Logie addressed the Medical Society of the County of New York, November 23, on "Basis of Proposed National Nomenclature of Disease."——Drs. William F. Verdi, New Haven, Conn., and Ira I. Kaplan addressed the Association of Italian Physicians in America, November 16, on "Carcinoma of the Large Intestine" and "Radiation Therapy in Carcinoma of the Large Intestine," respectively.——Dr. Leon T. LeWald, among others, addressed the International and Spanish-Speaking Association of Physicians, Dentists and Pharmacists, November 20, on "Syphilis of the Gastro-Intestinal Tract."——Drs. William D. Johnson, Batavia, and Henry M. Moses addressed the Medical Society of the County of Kings, November 17, on "Emergency Surgery" and "Pulmonary Neoplasms," respectively.——Dr. Arthur M. Fishberg addressed the Medical Society of the County of Queens, November 20, on "Clinical Phases of Essential Hypertension."——Dr. Charles A. Waters, Baltimore, addressed the New York Roentgen Society, November 16, on "Early Recognition of Tuberculosis of the Kidney and Ureter by Pyelography."——Dr. Joseph C. Bloodgood, Baltimore, addressed the Bronx County Medical Society, November 18, on "Benign and Malignant Tumors of the Breast."

## NORTH CAROLINA

**Personal.**—Dr. Stephen Glenn Wilson, Dunn, has been appointed health officer of Sampson County, succeeding Dr. John D. Kerr, Jr., resigned.

**Society News.**—Dr. Rutherford B. H. Gradwohl, St. Louis, addressed the Buncombe County Medical Society, Asheville, November 2, on "Usefulness of the Schilling Blood Methods in Diagnosis and Treatment." Arthur I. Kendall, Dr.P.H., Chicago, addressed the society in September on filtrability of bacteria.——Dr. James W. White, New York, was the guest speaker at the meeting of the Ninth District Medical Society, Lexington, September 24, on "Strabismus in Children."——The Eighth District Medical Society met at Reidsville, October 2, with the following speakers, among others: Drs. Wingate M. Johnson, Winston-Salem, on "General Infections and Local Conditions"; Marion Y. Keith, Greensboro, "Infantile Diabetes"; Grady C. Cooke, Winston-Salem, "Peroral Endoscopy and Surgery."

## PENNSYLVANIA

**Changes in State Medical Board.**—Three new members have recently been appointed to the State Board of Medical Education and Licensure of Pennsylvania. Drs. Arthur C. Morgan and Clarence Bartlett, Philadelphia, and Charles J. Hemminger, Somerset, have succeeded Drs. Edgar M. Green, Easton, Merl V. Hazen, Harrisburg, and William M. Hillegas, Philadelphia. Dr. Irvin D. Metzger, Pittsburgh, chairman, and Dr. Harry W. Albertson, Scranton, were reappointed.

**Symposium on Pneumonia.**—At the scientific meeting of the Allegheny County Medical Society, Pittsburgh, November 17, a symposium was presented on pneumonia as seen in Pittsburgh. Speakers were Mr. H. B. Meller of the bureau of smoke regulation, on "Hygienic Aspects of the Air Pollution Problem"; Drs. Charles B. Maits, "Comparative Mortality Rate of Pneumonia in Pittsburgh"; William W. G. MacLachlan, "Clinical Problem of Pneumonia in Pittsburgh," and Ralph R. Mellon, "Significance of the Blood Culture in Relation to Lobar Pneumonia." Miss Rena Eckman, director, department of dietetics, Montefiore Hospital, presented a paper on "Relation of Vitamins to Nutrition and Disease."

**Society News.**—Clarence M. Wolf, Ph.D., addressed the Harrisburg Academy of Medicine, October 20, on "Calcium and Glandular Metabolism."——Dr. Howard E. Milliken, coroner of Dauphin County, addressed the Dauphin County Medical Society, November 3, on the work of his office.——Dr. John H. J. Upham, Columbus, Ohio, delivered the Emerling Lecture of the Pittsburgh Academy of Medicine, November 24, on "Heart Disease and Heart Failure: The Modern Problem of Late Middle Life."——Dr. Lewis Kraeer Ferguson, Philadelphia, addressed the Northampton County Medical Society, Easton, November 20, on "Treatment of Varicose Veins and Ulcers by Ligation."——Dr. Ralph M. Tyson, Philadelphia, addressed the Luzerne County Medical Society, Wilkes-Barre, October 21, on diagnosis and management of infantile paralysis.

**Health Council Formed.**—Health and welfare agencies, public and private, in Pittsburgh and Allegheny County have organized the General Health Council as a coordinating body for their activities. The constitution of this organization, adopted October 27, states that its objects are:

To coordinate public health activities of public and private agencies in Pittsburgh and Allegheny County.
To cooperate with the educational programs of the legally authorized state, county and city health departments and to promote such activities of other private and public health agencies.
To serve as a forum for frank discussion of health problems, policies and plans.
To develop new and to improve present standards of service.
To secure the active support of the general membership of the member agencies for the measures agreed on by the coordinating committee.
To plan new public health activities which do not fall within the scope of any constituent agency.
To foster the development and maintenance of a bureau of authoritative health information for educational purposes.

Mr. Lester R. Perry, recently appointed executive secretary of the Allegheny County Medical Society, is acting executive secretary of the council.

### Philadelphia

**Mayor Commends Health Officer.**—Harry A. Mackey, mayor of Philadelphia, has issued a statement commending Dr. Orlando H. Petty, appointed health officer of Philadelphia following the death of Dr. Andrew A. Cairns in September. The statement cites Dr. Petty's work in the treatment of diabetes and refers to his record in the World War, for which he was awarded the Congressional Medal of Honor as well as the Distinguished Service Cross, the French Croix de Guerre with palm and the Italian War Cross.

## RHODE ISLAND

**Society News.**—The regular quarterly meeting of the Rhode Island Medical Society in September was addressed among others, by Drs. George A. Elliott, Providence, on "Mental Attitudes Associated with Deafness"; Henry O. Colomb, "Psychiatric Aspects of Medical Conditions," and Wilfred Pickles, "Use of Air Injection for Neurological Diagnoses."——The annual outing and dinner of the Rhode Island Ophthalmological and Otological Society was held recently at Wickford. Through the courtesy of Dr. George W. Van Benschoten, Providence, the members of the society enjoyed a yacht ride. Dr. Frank W. Dimmitt, Jr., Providence, was elected president, and Dr. Nathan A. Bolotow, Providence, secretary.——Dr. Anson B. Ingals, Providence, addressed the quarterly meeting of the Washington County Medical Society, Westerly, October 14, on "High Points in Public Health."——At the meeting of the Providence Medical Association, November 2, Dr. Alexander M. Burgess discussed recent advances in the treatment of

syphilis and Drs. Marshall N. Fulton, Francis M. Thurmon, and Clifford L. Derick, all of Boston, participated in a symposium on advanced syphilis.

## WISCONSIN

**Personal.**—Dr. Horace P. Mahan, assistant superintendent at the state sanatorium, Statesan, Wis., has been made medical director of the American Legion Hospital, Battle Creek, Mich.

**Laboratory Diagnosis of Pregnancy.**—The University of Wisconsin Medical School made available to the medical profession of the state this month a service for the laboratory diagnosis of pregnancy. For some months, tests of urine from supposedly pregnant women have been made for physicians in the Wisconsin General Hospital and others interested. The success of this service led to the plan for giving similar diagnostic service to all physicians in the state who desire it. Tests will be done at present by two methods, according to the announcement, to reduce chances of error. The work will be done on a cost basis, a charge of $5 having been set for the present. Those who submit samples for testing are asked to send the patient's age, evidences of possible abnormal pregnancy and probable duration of pregnancy.

**Society News.**—The third councilor district of the State Medical Society of Wisconsin held its annual meeting in Madison, November 13. Clinics were held at several Madison Hospitals during the morning, and the afternoon was devoted to a scientific program of addresses. Speakers were Helen T. Parsons, Ph.D., on "Vitamins in Nutrition"; Drs. Joseph Brennemann, Chicago, "Vitamin Therapy"; Orville R. Lillie, Milwaukee, "Early Treatment of Injuries," and Roland M. Klemme, St. Louis, "Cerebrospinal Injuries."——Dr. Herman C. Schumm, Milwaukee, recently addressed the Kenosha County Medical Society, Kenosha, on infantile paralysis and its treatment.——Dr. E. W. Exley, Green Bay, addressed the Marinette-Florence County Medical Society, October 17, on "Differential Diagnosis and Treatment of Pyelonephritis."

## GENERAL

**Registration of Rhinoscleroma.**—At the International Congress of Otorhinolaryngology in Copenhagen in 1928 it was decided that the spread of rhinoscleroma beyond its former geographic limits has rendered desirable a world-wide registration of cases as a basis for a report on the subject at the next congress at Madrid in 1932. Registration blanks may be obtained from Dr. Chevalier Jackson, Temple University School of Medicine, Philadelphia.

**Federation of Societies of Tropical Medicine.**—*Science* reports that an International Federation of Societies of Tropical Medicine has been formed in Paris, with Prof. Charles Achard as president. Its purpose is to coordinate study and research in these subjects. Col. Charles F. Craig, professor of tropical medicine and director of the department of tropical medicine at Tulane University of Louisiana School of Medicine, New Orleans, has been elected a member of the international council of the organization and secretary general of the commission for scientific study of tropical disease.

**Decline in Whooping Cough Mortality.**—The death rate from whooping cough among young policyholders of the Metropolitan Life Insurance Company in 1930 was the lowest ever recorded among this group of children, 20 per hundred thousand. There has been a steady decline since 1911, when the rate was 90 per hundred thousand. Children under 3 years old suffer 92 per cent of the deaths and infants under 1 year nearly 60 per cent. The highest incidence of cases, however, appears to be among children from 3 to 6 years old. The decline is attributed to the reporting of the disease and isolation of the patients required within recent years.

**Medical and Surgical Association of the Southwest.**—The seventeenth annual session of the Medical and Surgical Association of the Southwest will be held in Phoenix, Ariz., December 3-5, with headquarters at the Hotel Westward Ho. The scientific program includes papers by Drs. Fred H. Kruse, San Francisco, on "Jaundice"; Alexius M. Forster, Colorado Springs, "Tuberculosis"; Henry Norman Bethune, Montreal, "Some Procedures in Thoracic Surgery"; William L. and Charles P. Brown, El Paso, "Do the Operative Mortality and Sequelae Justify Operation on Borderline Gallbladder Cases?"; Nelson W. Barker, Rochester, Minn., "Nephrosis," and Virgil G. Presson, Tucson, "Intestinal Allergy and the Sequelae."

**Examining Board of Stomatology Proposed.**—A group of dentists and physicians in New York have recently applied for a charter on which to found an "American Board of Stomatology" similar to boards established in the specialties of otolaryngology and obstetrics and gynecology. Stomatology is defined as "the branch of medical science which treats of the anatomy, physiology, pathology, therapeutics and hygiene of the oral cavity, the tongue, teeth and adjacent structures and tissues and the relationship of this field to the entire body." The board is intended as a liaison organization between medicine and dentistry. Election to membership would entail as a prerequisite examinations oral or written.

**Another Four Weeks of Automobile Fatalities.**—The U. S. Department of Commerce announced that, during the four weeks ended October 31, eighty-two large cities in the United States reported 717 deaths from automobile accidents. This number compares with 750 deaths during the four weeks ended Nov. 1, 1930. Most of these deaths were the result of accidents that occurred within the corporate limits of the city, although some accidents occurred outside the city limits. For the fifty-two week periods ended October 31 and Nov. 1, 1930, the totals for the eighty-two cities were, respectively, 9,031 and 8,726, which indicate a recent rate of 25.4 per hundred thousand of population as against an earlier rate of 24.9. One city reported no death from automobile accidents for the last four weeks.

**Red Cross Activities.**—The greatest activity of the American Red Cross during the fiscal year ended June 30, 1931, was in drought relief, in which 614,504 families were given aid. At the peak of the emergency, February 28, assistance was being given to 2,071,000 persons. The public contributed $10,589,780.19 and the Red Cross gave $5,000,000 from its treasury for this service, said to be the greatest emergency the organization has met in its peace-time program. Other operations included service to 433,195 ex-service men or their families; assistance to 10,521 members of the army, navy or marine corps or their families; 1,338,550 visits to homes and inspection of 1,015,906 school children by public health nurses; 56,273 persons taught home hygiene and care of the sick; nutrition classes for 127,446 children and 10,490 adults; 72,255 first aid certificates issued; 3,827 volumes transcribed in braille.

**Society News.**—The officers elected at the seventh annual meeting of the Western Branch of the American Urological Society in San Francisco, November 6-7, are Drs. Harry Welland Howard, Portland, Ore., president; Archibald W. Hunter, Vancouver, B. C., president-elect, and Frank S. Dillingham, Los Angeles, secretary. The next session of the association will be held at Portland, Ore., July 1-2, 1932.——The National Conference on Prescription Economics was organized, September 28, during the annual meeting of the National Association of Retail Druggists, to bring about correlation of prescription surveys and to act as a clearing house for such information. Ambrose Hunsberger, Philadelphia, was elected president and Frank A. Delgado, St. Louis, secretary.——Dr. George F. Stephens, Winnipeg, Manit., was elected president of the American Hospital Association at its recent meeting in Toronto.

**Bequests and Donations.**—The following bequests and donations have recently been announced:

St. Vincent's, Presbyterian and Mount Sinai hospitals, all of New York, each $1,000 by the will of the late Mr. Sol Kohn.

Englewood Hospital, Englewood, N. J., and New York City Association for Improving the Condition of the Poor, each $50,000 by the will of the late Senator Dwight Whitney Morrow, Englewood, N. J.

St. Luke's Hospital, New York, $25,000, and the Northern Dispensary, $20,000, from the late George DeForest Barton, retired naval officer.

New York Eye and Ear Infirmary, $7,500 by the will of the late Mrs. Eline R. Cameron, Brooklyn.

Roosevelt Hospital, $1,000,000; Manhattan Eye and Ear Hospital, $100,000; Salvation Army Hospitals, $1,000,000; Beekman Street Hospital, $25,000, all in New York; Samaritan Hospital, Brooklyn, $72,400; St. John's Riverside Hospital, Yonkers, $50,000, by the will of the late Lloyd W. Seaman.

Free dispensaries of Johns Hopkins and Sinai hospitals, each $25,000, and Sinai Hospital to found the Sarah S. Mandelbaum Graduate Nurses' Fund to provide two annual awards for graduating nurses; to the Children's Hospital School for crutches and equipment for crippled children; "Mount Pleasant," Jewish Home for Consumptives, Reisterstown; Hospital for Consumptives of Maryland, Towson, and to the Sisters of Mercy to maintain a room at Mercy Hospital, Baltimore, each $5,000 by the will of Mr. Seymour Mandelbaum.

Methodist Episcopal Hospital, Brooklyn, $10,000 by the will of the late Simon J. Harding.

Jewish Memorial Hospital, $1,500 from the estate of Rose Levy.

St. Agnes' Hospital, White Plains, N. Y., United Hospital, Port Chester, and Servants for Relief of Incurable Cancer, Hawthorne, $5,000 each by the will of George J. Werner, Rye, N. Y.

Muhlenberg Hospital, Plainfield, N. J., $15,000 by the late Ernest R. Ackerman.

Mount Sinai and Montefiore hospitals, New York, $10,000 and $5,000, respectively, by the will of Felix Herzfeld.

Vanderbilt Clinic, New York, $1,000 by the will of Madeline S. Litchfield.

Montefiore Hospital, $35,000 by the will of Sigmund M. Lehman.

Indiana University Medical Center, Indianapolis, about $310,000 by the will of the late Mr. Guilford A. Daitch

# Foreign Letters

## LONDON

*(From Our Regular Correspondent)*

Oct. 31, 1931.

### The British College of Obstetricians and Gynecologists

The recently founded British College of Obstetricians and Gynecologists has held its inaugural ceremonies, at which honorary fellowships were conferred on Prof. Paul Bar of Paris, Professor Essen-Möller of Lund, and Prof. J. Whitridge Williams of Baltimore. In proposing the toast of the college, Sir Thomas Horder expressed surprise that it was not formed long ago. Obstetrics was not comparable to the more limited specialties, such as ophthalmology, laryngology and dermatology. It was more fundamental, for it had to do with the entry of a new individual into the world, with all the precariousness attaching to the first few days of existence and with all those accidents—physiologic, chemical, anatomic and infective—which may befall the expectant, actual and recent mother. Some day we might be able to boast of an academy of medicine of which the three pillars would be medicine, surgery and obstetrics. The Royal College of Physicians of London had asked the council of the new body to nominate a panel of names for examinations for the diploma, and the council suggested that the college should institute a higher diploma comparable to those of the Royal Colleges of Physicians and Surgeons.

The president, Prof. W. Blair Bell, said in reply that between 3,000 and 4,000 years ago, in Sumerian times, midwifery was a segregated and important subject, while other branches of medicine hardly existed. He hazarded the opinion that before 1945 the college would be intimately associated with the Colleges of Physicians and Surgeons, to their mutual benefit, though today men were much more concerned in not dying than in being born. The aims of the college were to improve the status of obstetrics and gynecology and the education of the physician in these subjects. The attainment of these aims would benefit the state and could not be achieved apart from the new college.

### Panel Physicians and National Economy: Government Proposal Accepted

The cut of 10 per cent in the capitation fee of panel physicians, as part of the economy proposals of the government, has been mentioned before. It was again discussed at the annual conference of medical panel committees. Dr. Dain, chairman of the insurance acts committee of the British Medical Association, stated that when the new minister of health, Mr. Neville Chamberlain, invited the committee to send a few representatives to discuss the situation, he disclosed the serious nature of the national situation and said that the government proposed to accept the 24 cent reduction in the capitation fee of panel physicians recommended by the economy committee. Dr. Dain replied that if the capitation fee was reduced it would raise the merits of the amount of the fee, but if the minister was not entering on that question and was merely proposing the reduction solely from the point of view of the national emergency, a temporary reduction of one ninth would better meet the case. The minister said that he had no intention of opening the question of the merits of the fee and that what was required was a temporary reduction to meet the national emergency. It was further pointed out to him that the reduction represented a cut of something like 15 per cent, when allowance was made for the expenses relating to practice. The scheme was part of a plan of equal sacrifices by all in a national emergency and was not amenable to modifications. On this assurance it was accepted. But later the government modified the proposals as regards other classes: the army, navy, police and school teachers. The minister was therefore asked to make the reduction 10 per cent after deducting expenses, but the government was unable to agree.

A motion protesting against the action of the representatives in agreeing to the cut in the first instance was rejected by an overwhelming majority. A resolution was then moved approving of the action taken in the negotiations with the minister, recognizing the special sacrifices which panel physicians were called on to make, and accepting the 10 per cent reduction as their contribution in the exceptional circumstances in which the nation finds itself, but without prejudice to the future consideration of the present capitation rate on its merits. An amendment protesting against the reduction was discussed with some acrimony at one point but was rejected, and the resolution was carried by an overwhelming majority. Patriotic motives in the present emergency, the excellent effect produced on the public attitude toward economy by the acceptance of the cut in the first instance, and the good position of the profession for later reopening the question of remuneration were weighty reasons. Finally a resolution that the question of the adequacy of the capitation fee be taken up with the ministry of health at the earliest suitable moment was carried unanimously.

### Changes in the Jaws of the English

In a lecture delivered at the Royal College of Surgeons, Sir Arthur Keith said that years ago he began to notice modern changes in skulls. Our present conditions of life were a huge experiment. The industrial revolution, life in cities and changes in diet must affect our bodies. But not until archeologic knowledge became precise, twenty or thirty years ago, was there any certain way of dating ancient graves and determining the period to which skulls belonged. He expected that narrowing of the palate was due to the conditions of modern life, as this condition is never found in the skulls of the Saxon or pre-Saxon period. For comparison he took fifty ancient British skulls, buried before the Norman period, and the same number of modern skulls, chiefly of Londoners of the eighteenth and nineteenth centuries. In each case, half the skulls were male and half female. The result was to strengthen his conviction that definite changes are being produced in our teeth, jaws, noses, orbits, cheeks and other points in the conformation of our faces. But such changes are not found in every one. In no ancient skull was there a pathologic degree of contraction of the palate, while four of the twenty-five modern male and nine of the twenty-five modern female skulls showed contraction. Misplacement of the front teeth occurred with the same degree of frequency in the modern skulls. Failure of formation of the third molar is an index of dental degeneration, for retrograde changes are first shown in the member of a series last formed. In the twenty-five ancient male skulls there should have been fifty upper third molars; there were only forty-four; in the twenty-five ancient female there were seven failures to form, and five molars had formed but failed to erupt. Thus in pre-Norman times there was a tendency among a few men and a considerable number of women toward reduction of the teeth. But in the modern skulls the tendency was more widespread; there were fifteen instances of undeveloped third molar in the upper jaw and five of arrest of development in males, and almost the same number in females. In a collection of modern skulls, the teeth, jaws and faces may be found as robustly and symmetrically developed as in ancient skulls but in diminished proportion. As a result of this and other investigations, Sir Arthur Keith has found that in all sections of the British population at least 25 per cent show gross disturbance of the growth of the palate or eruption of the teeth.

At one time he held the general opinion that contraction and vaulting of the palate was due to obstruction of the nasal airway by adenoids and enlarged tonsils. But prolonged inquiry into the disorders of growth of the palate and jaws, and the

changes of acromegaly and of other conditions produced under the influence of alteration in the internal secretions has compelled him to recognize that the theory of nasal obstruction cannot account for the disturbance of growth. He believes that adenoids, enlarged tonsils, irregularities of the growth of the jaws, and contracted palate are due to disturbances of the endocrine system concerned in the regulation of natural growth. This may be due to deficiencies in diet. Possibly, want of vitamins acts through the endocrine glands. We now know that the parathyroid gland can profoundly affect the skeleton.

### Human Errors in Aviation Accidents

An analysis of the causes of flying accidents, and suggestions for diminishing risk, were laid before the Royal Aeronautical Society by Capt. A. G. Lamplugh, who has been responsible for the development of aviation insurance in this country. He said that since January, 1928, errors of judgment in one form or another were responsible for at least half the accidents. During the same period, accidents due to structural or mechanical breakdown declined continuously until they reached about 20 per cent. At a conservative estimate, direct damage amounting to $7,500,000 had been caused to European civil aircraft, engines and equipment since January, 1928. This meant $3,750,000 for personal errors, against only $1,500,000 for mechanical or structural damage and only $450,000 for damage caused by flying in bad weather, the worst physical feature they had to deal with. To these figures might be added anything up to 50 per cent for indirect loss, which gave the appalling total of $6,500,000 for loss attributable to errors of judgment. In 1929, this factor for both professionals and amateurs was 35 per cent. In 1930 for professionals it had dropped to 17.06, but for amateurs to only 33.65. To some extent this was accounted for by a great increase in the number of amateur and consequently inexperienced fliers during this period. An illuminating feature was the percentage mortality among pilots. As regards age, the danger was in the early twenties; between 30 and 40 the professional pilot's expectation of life appeared to be good compared with any other class of pilot, particularly in handling large multi-engined aircraft on regular air lines. Among amateur pilots the number of fatal accidents due to overconfidence, inadequate training, carelessness or foolhardiness was distressing. The danger periods in an amateur pilot's career appeared to occur at three stages: (1) between 20 and 30 hours, possibly as a result of secondary dual instruction; (2) between 80 and 120 hours, generally through overconfidence, and (3) between 500 and 600 hours. This period is not so easy to account for, but it may be explained by the pilot having acquired reasonable skill in the handling of aircraft but not sufficient under certain conditions of the elements. Aerobatics were sometimes the cause of structural failure in the air. Improvement might be made by raising the standard of training and skill required for an amateur's license, stricter traffic control at aerodromes, and the development of heavy oil engines and safety devices, particularly to increase control at low speeds.

### Should the Blind Teach the Blind?

The question whether blind or sighted teachers are the better for the instruction of blind children came before the education committee of the London County Council. In July, 1930, the council decided that in the future no blind teachers should be appointed to a school for blind children, as it was felt that more could be done for them by sighted teachers. The teaching staff subcommittee then received a deputation from the National Institute for the Blind, the College of Teachers for the Blind, the Union of Professional and Industrial Blind, the London Teachers Association and the National Union of Teachers, requesting that the decision should be reconsidered. The deputation emphasized the desirability of employing blind teachers, mainly on account of their personal experience of the handicap of blindness and their consequent special ability to deal with blind children. While admitting the strength of the argument, the subcommittee reasserted its view that the sighted teacher may be the better able to create a happy outlook and to teach blind children to overcome their limitations. It pointed out that if the council rescinded its resolution blind persons would be encouraged to take courses of training as teachers and might subsequently find themselves unable to secure employment on merit in competition with sighted persons. But feeling that a wider interpretation had been given to the council's resolution than was intended, and in order to remove the apprehension that so definite a pronouncement of the council's views might discourage blind persons from applying for any employment in which they can establish their merit, the subcommittee recommended that the original resolution be rescinded.

## PARIS

*(From Our Regular Correspondent)*

Oct. 21, 1931.

### Congress on Methods of Eradicating the Rat

Of the many congresses held in Paris the past season, one of the most peculiar was the Congress on Rats, which convened at the Institut Pasteur in Paris. The initiative in its organization was taken by Prof. Gabriel Petit of the Ecole vétérinaire d'Alfort, and it was held under the chairmanship of Dr. Marchoux. Many foreign scientists participated; for with the question of rats was associated naturally the question of the plague. Several governors of colonies were present; likewise Mr. Jitta, president of the superior council of the Netherlands, and Dr. Ricardo Jorge, delegate from Portugal. A first meeting was held in 1928, which delegated to the congress of 1931 the task of organizing an international league for protection against rats. In his inaugural address, Prof. Gabriel Petit stated that, even before the war, the annual damage caused by rats to agricultural products was estimated at a billion dollars for the United States, $40,000,000 for France, £15,000,000 for England, $50,000,000 for Germany, and similar vast amounts for other countries. Recent statistics raise to a billion gold francs (nearly $200,000,000) the losses caused to the national wealth by the hordes of rodents that infest French territory. That is why this year especially, in view of the International Colonial Exposition, the second international conference and the Congrès colonial du rat et de la peste have assumed particular importance. Many communications were presented setting forth the huge destruction caused by rats in the cities, in the rural districts and especially on board freight steamers. Only a few of the most important conclusions can be presented here. There was general agreement as to the dangerous rôle of the rat in the propagation of the plague, typhus and certain spirochetoses (such as sodoku and possibly leprosy). Furthermore, rats are great destroyers of grain, being more destructive than all the cryptogamic diseases combined. In the colonies particularly, they destroy the seeding and the crops. Of the many different means proposed for combating rats, it appears that often the cat and the terrier are the best available. It has been demonstrated that the presence of a single Siamese cat or of a fox terrier on a plantation is often sufficient to cause all rats to disappear. On board grain transports, a few cats will always destroy the rats, which, in certain ports infested with rats, succeed in gaining entrance to the holds of the vessels. But deratization is more difficult on land, especially in the large grain fields. Several new methods were explained during the course of the congress, at which many communications were presented by Mr. Loir, Lieutenant General Manera of Rome, Professor Petit, Mr. Dujardin-Beaumetz, Hauduroy and Neveu (vaccination of animals against the plague), and Mr. Gobert. Mr. Loir succeeded in creating, by process of selection, a breed of large

cats excellent as rat hunters, which, at Havre more particularly, have demonstrated their capacity for rat destruction. In Paris, where the rats multiply in the sewers, and where they destroy even telephone wires, one employs preferably, as in Morocco, traps baited with slices of bread spread with a phosphorated paste. The traps must be set with great care, no human hand touching either the bread or the traps. They are prepared with metal pinchers and the persons setting them wear rubber gloves; otherwise the rats, which are wary and easily catch a human scent, keep away from the traps. Every week the body of a rat, together with the fleas found on it, is examined at the special laboratory of the prefecture of police to ascertain whether or not the plague bacillus is present, and, strange to relate, the bacillus is found not so infrequently, in spite of the fact that no trace of plague exists in Paris. The public has been urged to use tight-fitting covers on all receptacles containing garbage, left at the curb every evening, to be collected before morning by the scavenging department; for it has been noted that it is in garbage cans, if left open, that rats find their food. The conventionists took a trip to Havre to inspect Dr. Loir's breeding place for rat-catching cats.

### The Second Centenary of the Foundation of the Royal Academy of Surgery

In celebration of the second centenary of the foundation of the Royal Academy of Surgery, special ceremonies were held, October 7, at the Academy of Medicine, with the president of the republic in attendance. Professor de Lapersonne, the president of the Academy of Medicine, gave a short survey of the history of the society, which was founded in 1731 under Louis XV, J. Petit having been the first president. After creation of the Academy of Medicine under Louis XVIII, it became fused with that body (1820). Then, in 1843, without its connection with the Academy of Medicine being severed, of which the surgeons continue to form an important section, the latter founded a special society of surgery, which has achieved considerable success, its meetings being held every week, and new members being chosen at hotly contested elections. In addition, every year, in the fore part of October, a large congress of surgery is held, which is always attended by a large number of foreign surgeons. At the ceremonies recently held, addresses were delivered by Mr. Lapersonne, president of the Academy of Medicine; Professor Lenormant, president of the surgical society, and Professor Jean-Louis Faure. In the vestibules, a curious collection of old surgical instruments was displayed, together with historical records and interesting autographic documents taken from the archives of the former Royal Academy of Surgery.

### The International Congress of Comparative Pathology

The second International Congress of Comparative Pathology was held, October 14-18, at the Faculté de médecine in Paris. The first congress was held in 1912. The war and various other circumstances intervened to prevent until this year the holding of a second congress. The president of the republic and Mr. Landry, minister of labor, were in attendance. An original idea carried out by the society that organized the congress is that its membership consists of physicians, veterinarians and botanists, so as to afford an opportunity to study pathologic problems simultaneously in man, animals and plants, an important collaboration in obtaining knowledge of certain diseases, particularly cancer. The congress was attended by many foreign scientists, among others, from the United States, J. R. Mohler, George W. McCoy, Milton J. Rosenau, M. B. Waite, R. L. Jones and V. A. Moore. Outside of Paris, the conventionists held a meeting at the Ecole vétérinaire of Alfort, and another at the Centre anticancéreux de Villejuif. The topics on the program were: (1) tuberculosis and vaccination, (2) brucellosis in man and in animals, (3) milk and pathogenic agents, (4) mineral deficiencies, (5) ultraviruses, and (6) helminthiases. Numerous communications were presented, chief of which were the following: preventive vaccination against tuberculosis with the B C G vaccine, Professor Calmette; cytologic study of plants affected with deficiency diseases, Mr. Dufrénoy; antituberculosis vaccination in animals, Professor Gerlach of Vienna; therapeutic antituberculosis vaccination with serum and toxic tuberculous plasmas, Dr. P. Kfouri; bovine undulant fever, Martin Kristensen, Copenhagen; brucellosis in man, Prof. Oluf Bang, Copenhagen; the composition of milk, Dr. Lesné and Mr. G. Dreyfus-Sée; diseases of animal origin transmissible to man through milk, Porcher and Tapernoux of Lyons; mineral deficiences and mineral disequilibriums, Mr. Simonnet and Mr. Randoin; mineral deficiencies and their relations with the syndromes characterized by mineral disorders, Professor Sjollema of Utrecht; diseases due to mineral deficiency in domestic animals, Prof. J. Wester of Utrecht; American researches pertaining to plant diseases due to mineral deficiencies, Mr. Harry B. Humphrey of Washington; hibernation and the reappearance of cryptogamic diseases in plants, Prof. Jacob Ericksson of Stockholm; influence of the hydrogen ion on the development of phytopathogenic bacteria, Dr. W. Kotte, Freiburg im Breisgau; diseases due to viruses of cultivated plants, Mr. Quanjar, Wageningen, Netherlands, and Dr. von Brehmer, Berlin; transmission of the virus of the mosaic disease of the kidney bean through the pollen, Donald Reddick (Cornell University); the mosaic disease in the grapevine, Professor Stranak, Prague; the pathogenesis and therapeutics of helminthiases, C. Joyeux and J. Baer; intestinal parasitism among the colonial natives in France, Lieut. Col. Stevenel, M.D.; intestinal parasitism in the dark races of French possessions in Africa, Mr. Lefrou, general medical inspector for the colonies; diseases of plants caused by nematodes, Dr. Van Slogteren.

## BUENOS AIRES

*(From Our Regular Correspondent)*

Sept. 21, 1931.

### A Medical Week in Buenos Aires

The Jornadas Médicas, a medical week organized by the Asociación Médica Argentina, was held in Buenos Aires, August 17-25, 1931. The meeting was attended by delegates of the government and of the medical profession from several countries, as follows: Lord B. G. A. Moyniham, Sir Almroth Wright and Dr. John Freeman, from England; Dr. E. García del Real, from Spain; Drs. Blanco Acevedo, Escardó y Anaya and García Lagos, from Uruguay; Dr. A. Austregesilo, from Brazil; Drs. F. Legueu, P. Nobecourt and G. Dumas, from France; Drs. G. Donati and A. Castiglioni, from Italy, and Drs. A. Eckstein and K. Fahrenkamp, from Germany. Six official speakers delivered lectures of thirty minutes each every afternoon. When the discussion on the official lectures were finished, nonofficial lectures, prepared by the medical societies of Argentina and by the teachers of the School of Medicine of Buenos Aires, were also given. The main subjects of the deliberations during the first day were as follows: Dr. M. Castex stated that the red and white blood formulas are controlled by the thalamencephalon. Lord Moyniham spoke on old and modern medicine and on surgery of the bile ducts. Sir Almroth Wright gave demonstrations of his own technic for the treatment of war wounds; Dr. Bonorino Udaondo lectured on the mobile duodenum as observed in clinical practice; Dr. F. Legueu spoke on the importance of traumatic orchitis from the point of view of compensation laws; Dr. G. Araoz Alfaro gave a thorough discussion on the entire problem of infant mortality in Argentina. The second day, Dr. J. C. Navarro lectured on respiratory disturbances in syphilitic infants; Dr. E. Blanco Acevedo spoke on the removal of cancer of the breast, and he showed his own technic, which follows the most

modern precepts on cancerology and surgery. Dr. B. A. Houssay spoke on the influence of the hypophysis on the general metabolism. Dr. A. Eckstein covered the subject of postvaccinal encephalitis. Dr. A. Peralta Ramos stated that the blood cultures from women with puerperal septicemia are positive for the presence of infection, even some time after the patients have recovered. Dr. E. García del Real explained the mechanism by which the epidemics of acute anterior poliomyelitis are propagated in Spain. The third day, Dr. Austregesilo stated that capsular hemiplegia is often associated with extrapyramidal lesions, and he showed films and slides which he had prepared. Dr. Iribarne spoke on the indications of radioactive treatment in insufficiency of the ovary. Dr. R. Bullrich spoke on the characteristic changes of the electrocardiogram in angina pectoris due to aortitis or to stenosis of the coronary artery. He illustrated his lecture with the exhibition of electrocardiograms taken in thirty-five cases of that type of angina pectoris. Dr. E. Segura emphasized the great advantages of radical operation on the mastoid process through the auditory canal. Dr. M. Alurralde stated that arsphenamine therapy has caused an increase in neurosyphilis. The fourth day, Dr. P. Escudero stated that the alimentary diet has an essential therapeutic value. Dr. J. Freeman stated that diseases of an asthmatic type are related to asthma and that desensitization is therefore the proper treatment. Dr. Escardó y Anaya spoke on physical therapy as applied to children. Dr. M. Acuña lectured on the advisability of the performance of splenectomy as a treatment for hemolytic anemia in infants, as well as for anemia infantum pseudoleukaemica. Dr. J. A. Dominguez stated that combined quinine and barberry, given by the Indians years ago in malaria, still holds its place as a therapeutic measure effective in its results. The fifth day, Dr. N. Rojas read an interesting article on obsessive impulses to crime, in relation to medicolegal points of view. Dr. P. Nobecourt pointed out the indications of insulin therapy and thyroid therapy in denutrition in early infancy. Dr. H. García Lagos presented a clear exhibition of roentgenograms taken after injections of iodized oil, for diagnosis of pulmonary diseases and for the indication of operation in those conditions. Dr. A. Cabanne spoke on focal infections of the teeth. Dr. R. Argañaraz stated that oral septic foci, as well as blennorrhagia, either provoke various ocular disturbances or maintain them if they were present before the oral septic foci appeared. Dr. G. Castiglioni lectured on the new orientation of modern medicine. The sixth day, Dr. P. L. Baliña stated that there are certain types of intertrigo due to some species of Monilia. Dr. Donati spoke on the early diagnosis and surgical treatment of diseases of the colon. Dr. A. R. Marotta explained some forms of hepatic amebiasis.

### The Hypophysis and General Metabolism

During the medical week recently held at Buenos Aires, Dr. B. A. Houssay discussed the influence of the hypophysis on the general metabolism. The speaker stated that the anterior lobe of the hypophysis has a regulating effect on the general metabolism, of the same nature as its morphogenetic and stimulating effect on sexual glands and functions. Insufficiency of the anterior lobe of the hypophysis diminishes, while hyperfunction of that lobe increases the basal metabolism. The hypophysis stimulates the endogenous protein metabolism as well as the fixation of protein in the tissues, thus explaining the rôle of the overfunctioning of the pituitary body in the development of acromegalia and gigantism. The endogenous protein metabolism, more than the exogenous, is under the influence of the pituitary body. The presence of pituitary insufficiency diminishes the destruction of proteins in the tissues, as is observed during fasting and in phlorhizin diabetes and pancreatic diabetes. The creatinine elimination, the index of the endogenous nitrogen metabolism, is lower in dogs deprived of both pituitary and pancreas than in dogs in which the pituitary, but not the pancreas, has been removed, even though the latter receive meat in their diets. The dynamic specific action is diminished in man and in the rat with pituitary insufficiency though it remains normal in dogs in the same conditions. Well fed dogs deprived of the hypophysis have a normal glycemia which, however, falls to low figures during fasting. The animals frequently have a hypoglycemic crisis which may be fatal if not controlled by the administration of sugar. The hypoglycemic crisis may occur either spontaneously or following the administration of hypoglycemia-causing agents, such as insulin, phlorhizin or epinephrine, under the influence of fasting or in presence of diabetes. Hyperglycemias or glycosurias (which are present in epinephrine, avitaminic, phlorhizin or pancreatic diabetes) are not grave and may disappear during fasting while, on the contrary, the implantation of the hypophysis aggravates them. It is probable that acromegalic diabetes is due to hyperpituitarism. All the disturbances indicate that animals deprived of the hypophysis form less sugar at the expense of the endogenous proteins than normal animals do. The hypophysis, by its stimulating effect on the consumption of endogenous protein, has also an effect on the transformation of such protein into sugar.

## BERLIN

*(From Our Regular Correspondent)*

Oct. 12, 1931.

### Investigation of Smallpox Vaccination

A commission of recognized experts (hygienists, neurologists and pediatricians), appointed by the federal bureau of health, subjected to a scrutiny the published accounts of disorders of the nervous system alleged to have developed in connection with vaccination against smallpox. The commission has issued a report on the results of its investigations. While no claim can be made that the conclusions of the commission are absolutely accurate, they have a certain value. The report covers a total of 102 cases, which are all described as to their main features. As disorders of the nervous system following vaccination against smallpox, seventy-seven cases (twenty-five with a fatal issue) are described as occurring in persons vaccinated for the first time and four cases (all with a fatal issue) as developing in revaccinated persons. In two cases the commission was unable to reach an agreement; nine cases were rejected for various reasons, while in ten cases no definite decision could be made owing to the lack of the necessary evidence. These twenty-one cases were therefore left out of the account. Of the eighty-one accepted cases, fifteen were completely confirmed by the necropsy report. During the period under consideration, about one million persons each year received their first vaccination, while almost as many revaccinations were carried out. It is apparent that, during the four-year period, for each million persons vaccinated the first time there were nineteen disorders of the nervous system following the vaccination, with about six or seven deaths, and for each million of persons revaccinated there was one disorder of the nervous system, with a fatal issue. It is evident, therefore, that there is no cause for anxiety by reason of the postvaccinal disorders of the nervous system.

### The Treatment of Rabies

From the researches of the Geneva Health Commission and the report of E. Hesse, member of the German federal bureau of health, on inoculations against rabies in 1928, the following has been excerpted: The possibility of the appearance of a postvaccinal paralysis can never justify the omission of protective inoculation against rabies. The observations confirm previous views throughout: Bites of wolves cause fatal disorders forty-four times as frequently as bites of dogs. Deep injuries are ten times as dangerous as superficial lesions. The danger

of infection is reduced to one sixth if the patient was bitten through the clothing. A true opinion on the effectiveness of various vaccines cannot be obtained until all the cases in which rabies in the biting animal has been scientifically demonstrated are reported in detail, and not merely the cases that result unfavorably. Scientific authentication in cases of persons bitten by animals is not accomplished at present, to any great extent, by any other country besides Germany, and even in Germany positive demonstration of rabies was effected in less than 50 per cent of the cases. According to German observations in 1929, only two out of 148 persons bitten died, and in one case it is doubtful whether from rabies. Since at least one third of the biting animals were affected with rabies and in half of the persons bitten the injuries were serious, the favorable effects of the treatment are well established, being promoted to a great extent by the promptness with which it was applied—in from 73 to 80 per cent of the cases having been begun within a week after the biting occurred.

### University Clinic in Berlin to Be Closed

A perturbing event of this critical scientific period is the closing of one of the university surgical clinics in Berlin, which is set for April 1, 1932. The ministry of public education was induced by economic considerations to take this step. Only the policlinic will continue to function, but this will receive only ambulatory and no resident patients. The dismissal of the seventeen assistant physicians of the surgical clinic will take effect, April 1. Through the closing of this clinic 198 beds will be discontinued. An endeavor is being made to induce Professor Bier, who will soon complete his seventieth year of life, to assume the directorship of the policlinic during the transition period. After April 1, Berlin will have only one university surgical clinic, that at the Charité Hospital, the director of which is Geheimrat Prof. Dr. Sauerbruch.

For a year or more, the closing of the university surgical clinic in Ziegel Street has been a chief topic of conversation in medical circles. This clinic, which for many years has been the proud exponent of modern medicine, is the victim of this period of crisis. The building in which it is housed is greatly in need of repair, and for many years a reconstruction has been contemplated, which, under present conditions, would have cost as much as an absolutely new building, and for that the money is lacking. A year ago, Geheimrat Bier, the present director of the clinic, although he had about reached the age for retirement, was asked to retain the directorship for another year, that is, until April 1, 1932, as the funds were not available at present for the reconstruction long since planned. From a purely educational point of view, it is a disgrace to allow such an important institution, where such men as Langenbeck, E. v. Bergmann and Bier spent so many fruitful years, to disappear from the face of the earth.

### Changes in Family Life

The professional range of the physician is closely connected with the status of hygiene, and especially of social hygiene, as particularly the researches and discussions of the last decade have shown. Hence, emphasis must be laid on the fact that the structure of the family and of the family life has undergone some marked changes since the prewar period. Thirty years ago, the creation of collective households, of apartment houses with community kitchens, was advocated at all congresses of women. The married woman was thus to become free to pursue a gainful occupation and to become economically independent of her husband. That was to be the initial step toward the needed equalization of the sexes. It is interesting to note in recording statistical facts in regard to the family how the German people turns away from those theories that do not harmonize with its mental and psychic aptitudes. Dr. Annemarie Niemeyer, in connection with the researches on the family undertaken by the Deutsche Frauenakademie, collected material on the structure of the German family, from which it appears that 95 per cent of the population of Germany lives in familial households. Only 2.5 per cent live in institutional households, and 1.6 per cent in single, separated households. The number of familial households has increased considerably during the past decades—much more than the number of single, separate households. In addition to the force of circumstances (poverty, scarcity of dwellings), no doubt a natural tendency to live in large family groups is a factor in the production of this result. In any event, there is no evidence of any tendency to turn away from the family or of fleeing from family ties. On the contrary, statistics show that, during the period from 1910 to 1928, men showed an increased desire to marry. They marry also earlier than formerly, whereas the average age of brides has risen. While partly due to the economic necessity of creating the necessary basis for marriage, the marriage of men to older women is partly a trend of the times, which demand women of independent character and presuppose in marriage greater equality between the parties to the contract in place of subordination of one partner to the other. Only about 12 per cent of the women in Germany remain single. The excess of women over men, which existed before the war but was greatly exaggerated by the results of that conflict, is not as marked as it was a few years ago and in a few years more conditions will again be normal in that respect. In Germany's population of approximately 64,000,000, there are 15,700,000 housewives (that is, married women, including widows and divorcees). Of that number, 4,700,000, or more than 25 per cent, are devoting full time to occupations not connected with their own domicile. The percentage of wage-earners in a family, on the average, is highest among the employees and the civil servants, but it is almost as high among the industrial workers—about 55 per cent. On the other hand, there are 9,000,000 wives (husbands living), and 2,000,000 widows and divorcees devoting themselves exclusively to family, or household, tasks. Married persons live longer than single persons. This applies to both sexes; but as to the underlying reasons for this fact no information is forthcoming. The growing eagerness to marry has not, however, been accompanied by an increase in the number of offspring—quite the contrary. Various reasons are assigned for this condition of affairs.

## Marriages

CARL I. GILLIES, Cedar Rapids, Iowa, to Miss Katherine Marie Loomis of Ann Arbor, Mich., in Lincoln, Neb., October 2.

WILLIAM W. STEVENSON of Rockwell City, Iowa, to Miss Isabelle Hollister of Fort Dodge, October 14.

ALBERT E. WILLIAMS, Boyceville, Wis., to Miss Mary Frances McGraith in Glenwood City, recently.

ANGELO LOUIS GENTILE to Miss Queen De Frances Hippolitus, both of New Haven, Conn., May 25.

GAROLD GRAHAM HENNING, Iowa City, to Miss Ada Hemingway of Clinton, Iowa, August 22.

EARL LE ROY BURKY, Baltimore, to Miss Mary Dixon Norris at North Bend, October 31.

FRANK R. MEHLER, New London, Iowa, to Miss Margaret Marten of Burlington, October 1.

EARL RICHARD TEMPLETON, Buffalo, to Miss Emma Louise Wehr of Baltimore, November 7.

CASIMIR ARTHUR CYWINSKI to Miss Loretta Lucille Konopa, both of Chicago, November 14.

ROBERT EDWARD GROSS, Baltimore, to Miss Mary Louise Orr of St. Paul, June 11.

WILLIAM MCCULLOCH TUTTLE to Miss Geneva Duvall, both of Chicago, September 19.

WILLIAM A. BOCKOVEN, JR., to Miss Ruby Iverson, both of Cresco, Iowa, October 1.

# Deaths

**George Washington Webster** ⊕ Chicago; Chicago Medical College, 1882; at one time professor of physical diagnosis, clinical medicine and internal medicine at his alma mater; past president of the Illinois State Board of Health; formerly on the staffs of the Wesley Memorial Hospital and the Mercy Hospital; aged 74; died, November 7, in Rochester, Minn., following an operation for carcinoma of the sigmoid.

**James F. Kiernan,** New York; Fordham University School of Medicine, New York, 1917; member of the Medical Society of the State of New York and the Associated Anesthetists of the United States and Canada; formerly on the staffs of the Fordham Hospital, Union Hospital and the Bronx Eye and Ear Hospital; aged 39; died, September 28, of heart disease.

**Russell James McCurdy** ⊕ Seattle; Northwestern University School of Medicine, Chicago, 1918; member of the American College of Surgeons; president of the King County Medical Society; on the staffs of the Seattle General Hospital, Swedish Hospital, King County Hospital and Virginia Mason Hospital; aged 39; was killed, November 1, in an airplane accident.

**Frederick Bruce Mowbray,** Hamilton, Ont., Canada; University of Toronto Faculty of Medicine, 1905; member of the American College of Surgeons; aged 48; on the staffs of the Mountain Sanatorium, St. Joseph's Hospital and the Hamilton General Hospital, where he died, November 11, of heart disease, while performing an operation.

**James Thompson Whyte,** Winnipeg, Manit., Canada; McGill University Faculty of Medicine, Montreal, Que., 1893; served during the World War; treasurer of the Victoria Hospital; aged 66; died, June 15, in the Carman (Manit.) Hospital, of injuries received when the automobile in which he was driving overturned.

**George Dake Weston** ⊕ Springfield, Mass.; University of Pennsylvania School of Medicine, Philadelphia, 1887; for many years member of the school board; on the staffs of the Springfield Hospital, Wesson Maternity Hospital and the Mercy Hospital; aged 61; died, October 25, of carcinoma of the prostate.

**Andrew S. Stayer,** Fort Snelling, Minn.; Jefferson Medical College of Philadelphia, 1873; veteran of the Spanish-American War; formerly member of the state legislature of Pennsylvania; at one time member of the school boards in Altoona and Roaring Springs, Pa.; aged 83; died, September 26, of cerebral hemorrhage.

**Stewart Craig Thomson,** Byron, Ill.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1897; member of the Illinois State Medical Society; mayor of Byron; aged 61; died, October 30, in a hospital at Rockford, of injuries received when the automobile in which he was driving was struck by a train.

**Walter Forbyce Reynolds,** Barry, Ill.; St. Louis College of Physicians and Surgeons, 1893; Jefferson Medical College of Philadelphia, 1894; member of the Illinois State Medical Society; aged 59; died, October 31, in St. Mary's Hospital, Quincy, following an operation for gallstones and appendicitis.

**William Frederick Williams** ⊕ Bristol, R. I.; Harvard University Medical School, Boston, 1889; veteran of the Spanish-American War; past president of the state board of health; formerly state senator; for nineteen years member of the school committee; aged 71; died, October 28.

**Albert E. Brown,** Pasadena, Calif.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1897; formerly superintendent of the Lake County General Hospital, Waukegan, Ill.; aged 68; died, October 20, of coronary thrombosis and auricular fibrillation.

**B. Thaddeus Cox,** Winterville, N. C.; University of Maryland School of Medicine, Baltimore, 1888; member of the Medical Society of the State of North Carolina; formerly member of the state legislature and bank president; aged 68; died, November 1, of cerebral hemorrhage.

**William Besley Savage,** East Islip, N. Y.; Medical Department of the University of the City of New York, 1892; on the staffs of the Southside Hospital, Bay Shore, and the State Hospital, Central Islip; aged 65; died, October 29, in St. Vincent's Hospital, of gangrene.

**Charles Ehrgood Dowling,** Orange, N. J.; Jefferson Medical College of Philadelphia, 1896; member of the Medical Society of New Jersey; aged 62; on the staff of the Orange Memorial Hospital, where he died, October 27, of arteriosclerosis and chronic nephritis.

**William Preston Gardner,** Texarkana, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1925; member of the Arkansas Medical Society; aged 37; died, October 10, in a local hospital, of complications, following an operation for appendicitis.

**Charles MacDonald** ⊕ Oak Park, Ill.; Rush Medical College, Chicago, 1900; member of the American College of Surgeons; on the staff of the Jackson Park Hospital, Chicago; aged 60; died, October 31, of acute nephritis, lobar pneumonia and thrombophlebitis.

**Daniel Weston Rogers** ⊕ Highland Park, Ill.; Northwestern University Medical School, Chicago, 1894; formerly president of the board of health, Highland Park; aged 65; died, October 30, in the Highland Park Hospital, of carcinoma of the pancreas.

**Charles Frederick Wilcox, Sr.** ⊕ Salt Lake City; Medical Department of the University of the City of New York, 1890; formerly on the staff of the Dr. W. H. Groves Latter-Day Saints' Hospital; aged 72; died, October 21, of chronic myocarditis.

**George Austin McHenry,** McHenry, Miss.; Louisville (Ky.) Medical College, 1893; member of the Mississippi State Medical Association; veteran of the Spanish-American War; aged 73; died, October 12, of chronic interstitial nephritis.

**William Grant Morris,** Liverpool, Pa.; College of Physicians and Surgeons, Baltimore, 1878; member of the Medical Society of the State of Pennsylvania; aged 80; died, July 30, of hypertension, nephritis and myocarditis.

**Louis Robechek,** Rocky River, Ohio; Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1895; aged 60; died suddenly, October 18, of arteriosclerosis and cerebral hemorrhage.

**John W. Mitchell,** Washington, D. C.; Howard University School of Medicine, Washington, 1894; professor of materia medica and therapeutics, at his alma mater; aged 59; died, October 20, of carcinoma of the sigmoid.

**Adam Stuart Muir Chisholm** ⊕ Bennington, Vt.; Harvard University Medical School, Boston, 1883; aged 77; died, October 19, in the Albany (N. Y.) City Hospital, of diabetes mellitus and bronchopneumonia.

**Benjamin Franklin Holton,** Mexia, Texas; Memphis (Tenn.) Hospital Medical College, 1892; member of the State Medical Association of Texas; aged 77; died suddenly, June 28, of cerebral hemorrhage.

**Jonathan Green,** San Francisco; Cooper Medical College, San Francisco, 1896; served during the World War; on the staff of St. Francis Hospital; aged 65; died suddenly, October 16, of heart disease.

**John W. Murphy,** Lynchburg, Ohio; American Medical College, St. Louis, 1878; Civil War veteran; aged 86; died, October 24, in Hillsboro, of influenza, arteriosclerosis and mitral insufficiency.

**William Walters Dodson,** Greenville, S. C.; University of Maryland School of Medicine, Baltimore, 1888; aged 66; died, October 30, of uremia, chronic nephritis, arteriosclerosis and hypertension.

**John Augustus Whittle,** Rochester, N. Y.; Tufts College Medical School, Boston, 1903; veteran of the Spanish-American War; aged 53; died, in October, of chronic interstitial nephritis and myocarditis.

**John B. Sands,** Santa Monica, Calif.; Eclectic Medical Institute, Cincinnati, 1893; aged 77; died, October 20, of fracture of the femur as the result of a fall and of hypostatic pneumonia.

**Rupes F. Minnock,** Waco, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1884; for many years health officer of Waco; aged 75; died, August 9, of myocarditis.

**Harry E. Becker,** Quincy, Ill.; Hahnemann Medical College and Hospital, Chicago, 1905; member of the Illinois State Medical Society; aged 62; died, October 25, of cerebral hemorrhage.

**Harry C. Mahnken,** Leonia, N. J.; New York Homeopathic Medical College and Flower Hospital, 1909; aged 58; died, October 24, of chronic myocarditis, coronary sclerosis and epilepsy.

**Albert Martin Davidson,** San Antonio, Texas; Missouri Medical College, St. Louis, 1896; aged 60; died, October 15, in a local hospital, of hypostatic pneumonia and angina pectoris.

**William M. Davis,** Omaha; Missouri Medical College, St. Louis, 1884; member of the Nebraska State Medical Association; aged 75; died, October 10, of chronic myocarditis.

**George Viner Witney,** Houston, Texas; Bennett College of Eclectic Medicine and Surgery, Chicago, 1886; served during the World War; aged 70; died, July 23, of heart disease.

**Hiram McGowan** ✠ Harrisburg, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1868; Civil War veteran; aged 88; died, October 31, of heart disease.

**William Henry Bunnell,** Bridgeport, Conn.; College of Physicians and Surgeons in the City of New York, 1879; aged 73; died, October 29, of cerebral hemorrhage.

**Waldo Henry Tyler,** Manchester, Mass.; Harvard University Medical School, Boston, 1887; aged 74; died, September 21, of myocarditis and chronic arteriosclerosis.

**Kenneth I. Sutton,** Centerville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1884; aged 73; died, September 25, in a hospital at Nashville, of senility.

**Charles M. Henn,** Chicago; Hahnemann Medical College and Hospital, Chicago, 1890; aged 82; died, October 10, of myocarditis, endocarditis and cardiac asthma.

**Thomas Chisholm,** Toronto, Ont., Canada; Victoria University Medical Department, Coburg, 1881; aged 90; died, October 1, of heart disease and pneumonia.

**Ewen McEwen,** Smith Falls, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1887; aged 76; died recently, in the Public Hospital, Chatham.

**Leancy Bertram Rupert,** Cabincreek, W. Va.; Louisville (Ky.) Medical College, 1886; aged 68; died, September 7, in Charleston, of chronic myocarditis.

**Wallace G. Birdsong,** Tarpley, Tenn.; Vanderbilt University School of Medicine, Nashville, 1895; aged 62; died, October 21, of cerebral hemorrhage.

**Herbert T. Webster,** Los Angeles; Eclectic Medical Institute, Cincinnati, 1869; aged 88; died, September 25, of diabetes mellitus and chronic nephritis.

**William Moershel,** Homestead, Iowa; State University of Iowa College of Medicine, Iowa City, 1888; aged 66; died, October 27, of heart disease.

**Ulrich M. Griffin,** Girard, Kan.; Homeopathic Medical College of Missouri, St. Louis, 1880; aged 76; died, October 25, of cerebral hemorrhage.

**Benjamin Taylor Church,** Brookline, Mass.; Dartmouth Medical School, Hanover, N. H., 1878; aged 80; died, October 20, of heart disease.

**Thomas Francis McMahon,** Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1882; aged 69; died, October 25, of uremia.

**S. Byron Buckley,** Denver; Hahnemann Medical College and Hospital, Chicago, 1885; aged 69; died, September 25, of angina pectoris.

**David Hawthorne Gould,** Fenelon Falls, Ont., Canada; University of Toronto Faculty of Medicine, 1879; aged 79; died, in June.

**William N. Nolan,** Kaukauna, Wis.; Rush Medical College, Chicago, 1894; aged 61; died, October 17, of cerebral hemorrhage.

**Lyman A. Sayles,** South Lyon, Mich. (licensed, Michigan, 1901); aged 87; died, October 19, in Grand Rapids, of cirrhosis of the liver.

**Andrew McCracken,** Zillah, Wash.; Kentucky School of Medicine, Louisville, 1891; aged 70; died, August 22, of cerebral hemorrhage.

**Ernest Winstanley Ellis,** Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1921; aged 38; died, October 5.

**Narcisse Lacerte,** Levis, Que., Canada; School of Medicine and Surgery of Montreal, 1863; aged 92; died, September 18.

**Adam Scott Beuglas,** Hamilton, Ont., Canada; Victoria University Medical Department, Coburg, 1890; aged 77; died, July 5.

**Robert C. Meade,** Castlewood, Va.; College of Physicians and Surgeons, Baltimore, 1892; aged 64; died, October 10.

**Frederick W. Devitt,** Deep River, Conn.; Cleveland Medical College, 1897; aged 58; died, September 3.

## CORRECTION

**Dr. George Washington Campbell Is Not Dead.**—The report of the death of Dr. George Washington Campbell of Flora, Ill., in THE JOURNAL, Oct. 17, 1931, was erroneous. The basis of our report was a notice in the *Illinois Medical Journal.*

# *Correspondence*

## PAPER WORK FOR HOSPITAL ADMINISTRATORS

*To the Editor:*—There is no specialty in medicine that may be excused from its obligation to the bedside point of view. Administrative medicine as one of the more important public health activities has a clinical aspect which, in a peculiar sense, is the final reason for its existence as a specialty. The successful hospital constructionist is the man with the bedside point of view. Hospital equipment is more obviously related to the bedside. Professional and business staff organization, if it is not planned and later adjusted to the needs of the patient, defeats its own purposes. Hospital administration, which provides the experience on which construction, equipment and organization are finally based, must concern itself primarily with the bedside, for in the last analysis the hospital exists for the benefit of the patient, all other benefits that may be derived in connection with his care coming in the nature of by-products. The simon-pure administrator, who is a technician only and lacks the social mind, should be properly identified, and an appointment should be made which will give the hospital an opportunity to derive the greatest benefit from its communal relationships.

When society made the decision that patients lacking financial means with which to purchase adequate care could not be treated at home during acute illness with the best results, and considered it for the interests of the sick (and incidentally for the doctors' interests) to herd them in groups where they could be treated on a time-saving and efficiency basis, an extraordinarily great risk and responsibility were assumed. Large institutions must unfortunately be subjected to various complicated forms of government, and the interests of the individual must often be sacrificed to the interests of the group, if confusion and even anarchy are to be avoided; and government (rightly or wrongly) naturally imposes greater or less restraint, which, in turn, rarely brings comfort when it must be applied to the sick and their friends. There is something of a vicious circle which is thus engendered and against which the administration of the hospital must always be on guard. While restraint may not be avoided altogether, much can be done to mitigate its effects. The most potent remedy lies in the personal type of supervision.

The sick man who leaves his home, where he held the center of the stage and was the chief protagonist in the domestic drama, is often compelled to lose his identity when he is admitted to our large establishments. In the wards he finds himself one of the many and is required to show consideration for his sick neighbors, with whom he must share the sympathies and attention of the staff. He naturally craves for the personal interest of some one who will replace those who would never have left his side or relaxed in their solicitude for his welfare if he had stayed at home. The administrator of a hospital, if it is a small one, or his immediate assistant, if the hospital is a large one, should personally know every patient and contrive so to plan his working day as to give to those whom a trusting community has turned over to his care that rare feeling of confidence lacking to many who do not enjoy a personal acquaintance with a member of the staff.

The greatest blessing that may be vouchsafed to the sick who are confined in the wards of the hospital is the personal interest of the hospital administrator in the bedside, for that is where the lessons in humanity are to be learned. If the hospital is so organized that an excess of "paper work," which almost never relates to the patient's well being, keeps the administrator away from the bedside, it should be taken as a danger signal that all is not well with the plan or the personnel of the organization and that the time has come for readjusting the relation of the

staff to the patient. Obviously, the patient should not be asked to sacrifice more to the interests of an exclusive paper-work organization. E. M. BLUESTONE, M.D., New York.

Director, Montefiore Hospital
for Chronic Diseases.

## ANTERIOR PITUITARY TREATMENT FOR BALDNESS

*To the Editor:*—Following publication in THE JOURNAL, November 7, of my article on this subject, together with the newspaper publicity concerning the work, several thousand letters have been received from people whom I cannot answer. The press statements have been overenthusiastic. The experiments, while gratifying in certain types of baldness, do not indicate that a complete solution to this age old problem has been realized.

I write this letter particularly since several nonmedical organizations presumably interested only from a commercial point of view have already attempted to obtain material for promulgation to the public, and several charlatans have stated that they were personally associated with me and therefore absolutely competent to administer the method. I have had no associates and no one is authorized to speak for the experimental clinic which is being conducted by the research department of the University of Illinois School of Medicine.

While interesting, the results have not yet been such as to warrant extreme optimism. Only after extensive and exhaustive research will it be possible to say to what extent the method is specific. B. NORMAN BENGTSON, M.D., Maywood, Ill.

# Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

### BLOOD COUNT IN SURGICAL CONDITIONS

*To the Editor:*—In possible surgical cases just wherein does a blood count become a decisive factor in the decision that operation is actually indicated? If surgical intervention turns on relative proportion of whites and reds, how would one decide the question? I am thinking of these cases of subacute and so-called chronic cases of appendicitis. Rural practitioners see them often and have to depend on the judgment of surgeons. Briefly, give the physiology of the white and red blood picture in ordinary health and common complaints. W. H. DEWEY, M.D., Moville, Iowa.

ANSWER.—The normal white blood count ranges from 7,000 to 10,000 per cubic millimeter of blood. When the count is above 10,000 the condition is called leukocytosis. A leukocytosis may be physiologic, as in infancy, during pregnancy and after eating. The latter is important to remember, for when a blood count is to be taken for diagnostic purposes in any surgical case, this should be done when the patient is fasting; i. e., between meals.

A pathologic leukocytosis exists in many of the infective diseases and may be high in pneumonia and inflammatory conditions, especially when suppuration is present. In inflammatory conditions, a leukocytosis of 20,000 or over is usually indicative of suppuration. In suppurative appendicitis the leukocytosis may even reach 50,000, though it is usually between 20,000 and 30,000.

In appendicitis the white blood count is usually well over 10,000; that is, an absolute leukocytosis is present. There is an absolute increase of all the various types of white cells, including the polymorphonuclear leukocytes, which normally comprise about 75 per cent of them. When there is a relative increase in the percentage of polymorphonuclear leukocytes but no increase in the total number of leukocytes present, a relative polynucleosis exists. This is also sometimes termed a relative leukocytosis.

In appendicitis the height of the leukocytosis appears to depend more on the amount of toxins absorbed and the resistance of the patient to the infection than to the severity of the local infection. In general, however, a slight leukocytosis, from 12,000 to 15,000, usually indicates a catarrhal infection of the appendix, whereas, higher counts point more to severer grades of infection, and when the count is 20,000 or over, suppuration is probably present.

It cannot be too strongly emphasized, that occasionally, and not at all infrequently, a leukocytosis is absent both in mild and in severe cases of appendicitis. Furthermore, if the white cells show a normal count or only a slight leukocytosis, it is extremely important to make a differential white blood count, because this will often show the presence of a relative polynucleosis. A relative polynucleosis indicates inflammation just as surely as does an absolute polynucleosis. A high relative polynucleosis, with a normal white count or low leukocytosis, is generally believed to indicate a severe infection in a patient with poor resistance, whereas a high leukocytosis indicates good resistance.

One must always bear in mind, however, that in arriving at a diagnosis of appendicitis the leukocyte count is chiefly of value in connection with the other clinical observations and that by itself it is an unsafe criterion for either diagnosis or prognosis.

In connection with the diagnosis of appendicitis the red blood count has no diagnostic value. In the differential diagnosis, a low red count, which shows a tendency to fall still lower, if associated with the other clinical evidence, may suggest intra-abdominal hemorrhage.

### SENSITIVITY TO INSECTICIDE POWDER

*To the Editor:*—A man, aged 28, has an allergy toward a number of foreign proteins, among them being "Bee Brand" insect powders. Will you please make some suggestions relative to dealing with this peculiarity toward the powder? RICHARD A. IRONS, M.D., Thomasville, Ala.

ANSWER.—The "Bee Brand" insecticide, according to the manufacturer, is composed of powdered flowers of Pyrethrum cinerariaefolium. This substance is the common constituent of most insecticides which are used either in powder or in liquid form to destroy insects in homes, kennels, greenhouses, poultry houses and elsewhere. The flower is a member of the family Compositae and of the genus Chrysanthemum. Patients sensitive to pyrethrum may also be affected by the garden or florist variety of chrysanthemums. In addition, they are frequently affected by other pollens, especially the ragweeds. The treatment for such a case is first to eliminate contact with insecticides. If this is only incompletely possible, desensitization should be undertaken, starting with very dilute solutions of the material as for pollen cases. M. A. Ramirez (*J. Allergy* **1**:149 [Jan.] 1930) reports excellent results in such cases. The sensitiveness to other foreign proteins mentioned in this case affords additional problems which, in general, should be treated in the same manner — elimination of the offending substances, if this is possible, desensitization if necessary.

### ALEUKEMIA HEMORRHAGICA FOLLOWING ARSPHENAMINE

*To the Editor:*—A patient reported with the primary lesions of syphilis and was started on neoarsphenamine treatment. After the fourth injection, he developed what was diagnosed as agranulocytic angina. The typical mouth lesions were present and the white cell count fell to 2,500 per cubic millimeter with 100 per cent lymphocytes, and no polymorphonuclear leukocytes present in the entire smear. Following the blood transfusion the blood picture has approached normal and the patient's general condition is satisfactory. Will you please inform me as to the best method of continuing the antisyphilitic treatment in this case? Please omit name. M.D., Texas.

ANSWER.—This patient has probably had the reaction to neoarsphenamine known as aleukemia hemorrhagica or, perhaps better, stomatitis with aplastic anemia, since there is no mention of purpuric lesions in the case. The agranulocytosis is quite typical and the mouth lesions may vary considerably in severity and even assume the form of wholesale necroses. The patient has been fortunate to escape with his life. Under the circumstances it is wisest not to use any form of arsphenamine in the patient's further treatment, in spite of the serious disadvantage at which this places him, because of the early character of the infection. Treatment should be continued as soon as the mouth is in good condition by the use of bismuth intramuscularly, the salicylate being, in all probability, the most satisfactory salt. Great care must be taken with mouth prophylaxis to prevent the development of bismuth stomatitis. A spinal fluid examination is imperative to determine the possible presence of an asymptomatic neurosyphilis, which might call for such measures as fever therapy. Under any circumstances, the progress of a case which has shown such early and grave signs of intolerance to treatment is likely to be rather stormy.

### DERMATITIS FROM POTASSIUM MERCURIC IODIDE SOAP —INDURATION FROM MERCURIC SALICYLATE INJECTION

*To the Editor:*—1. I have a patient who after using Neko soap developed a severe dermatitis on the hands and forearms. May I have some information with regard to the incidence of dermatitis following the use of Neko soap? 2. Is one likely to get a marked local reaction following the use of mercuric salicylate intramuscularly? Two of my patients have recently developed quite severe painful indurations within thirty-six hours after injections. The preparation is over a year old. Would there be any connection between this point and the severe reaction? Please omit name.

M.D., Washington.

ANSWER.—1. Neko soap contains potassium mercuric iodide. We have no statistics on the incidence of dermatitis from Neko, but hypersensitiveness to mercury preparations is not rare. Is the patient sensitive to other forms of the drug? The alkali base of the soap may enhance the irritation.

2. A marked reaction to intramuscular injections of mercury develops in some patients after every injection, so that this method of treatment has to be given up. In the opinion of a competent authority on pharmacology it is quite unlikely that the age of the preparation has anything to do with it. These preparations are months, sometimes years, old when sold and so far as is known have not developed irritating properties after long keeping.

### TREATMENT OF SYPHILIS

*To the Editor:*—In January, 1931, a white woman, aged 23, was referred to me by her previous physician, when she moved to this vicinity. Three and one-half years previously, treatment was started in the primary stage. The serologic results were strongly positive at this time. The primary lesion healed promptly, and since that time there has been no evidence of syphilis, except persistent Wassermann and Kahn tests, both 4 plus. The physical examination is negative. I have been advised that her former physician administered eighty injections of neoarsphenamine, with the usual mercurial and potassium iodide courses in the course of three years with a few injections of a bismuth compound. I believe further treatment with neoarsphenamine not advisable, and have administered twenty injections of thiobismol (P. D. & Co.), but the reaction is still positive. May I ask how this case can be treated to reverse the reaction and what preparations and dosage should be used? Please omit name.

M.D., Iowa.

ANSWER.—In Wassermann-fast cases even intensive treatment may fail to reverse the serologic reaction. In view of the negative physical examination, treatment should be intermittent. Eight or ten injections of a bismuth preparation should be given twice yearly with occasional courses of iodides. Too much attention should not be placed on the positive Wassermann reaction. A spinal fluid examination should be done at some time. Any of the standard bismuth preparations described in New and Nonofficial Remedies for use in syphilis may be used.

### ULCERATIVE COLITIS WITH RESISTANT ULCERS OF SKIN

*To the Editor:*—A man, aged 54, has suffered for the last ten years, at three-year intervals, from ulcerative colitis with blood and mucus in the stools. For two or three years he felt well and the condition cleared up under diet and some form of medical treatment. Three years ago he developed ulcerations of the skin, legs and abdomen. This condition persists. The ulcers start as small sores having the appearance of a boil, the center gets necrotic, there is a circular area of redness, and the edges of the skin are undermined. This red area sloughs off and the condition goes on until the ulcers are from 2 to 4 inches in diameter. The laboratory diagnosis was some form of fungus infection. The Wassermann reaction is negative. Tests for tuberculosis and carcinoma are negative. The ulcers resist all treatment. Use of the deep cautery in the healthy skin around the ulcer area stopped the progress of ulceration three years ago but this time has no effect. The patient has had potassium iodide and calcium therapy; internally, mercurochrome-220 soluble, 2 per cent; 1 per cent antimony and potassium tartrate, intravenously; locally, potassium permanganate, metaphen and gentian violet. Can you suggest some form of treatment? Please omit name.

M.D., Wisconsin.

ANSWER.—The combination of ulcerative colitis and resistant ulcers of the skin suggests two groups of cases, those reported by Engman and Heithaus (*J. Cutan. Dis.* **37**:715 [Nov.] 1919), caused by one of the amebas, and those recently reported by Brunsting, Goeckerman and O'Leary (*Arch. Dermat. & Syph.* **22**:655 [Oct.] 1930) as pyoderma gangrenosum. If due to an ameba, the organism should be present in pus from beneath the overhanging edges of the ulcers. If found, emetine is indicated.

If no amebas can be found, the measures found by Brunsting, Goeckerman and O'Leary as most effective can be tried. General treatment consisted of acetarsone by mouth, general ultraviolet irradiations, and the intravenous injection of typhoid vaccine to produce a moderate febrile reaction. Too severe a reaction, in one instance, seemed to cause a slight exacerbation of the disease. In anemic patients, blood transfusion was beneficial.

Locally, prolonged warm baths, or sulphur baths consisting of a dilute mixture of precipitated sulphur, sulphuric acid and sodium thiosulphate were helpful. A paint of dilute aqueous solution of gentian violet and acriflavine hydrochloride was more effectual than anything else in checking the spread of some of the ulcers. The skin healed when the bowel condition improved, and recurred with bowel recurrence.

### LOW BASAL METABOLISM AND OBESITY

*To the Editor:*—Can you give me some advice and assistance with a stubbornly persistent low basal metabolism? It began at 26, 27 and 28 minus on three alternate days. With thyroxine beginning at 0.2 mg. and increasing to 1 mg. daily, it was raised to minus 7. With a dosage of 0.2 mg. it dropped again to minus 23, at which point it is practically impossible to reduce it with any ordinary reduction diet. In addition to the thyroxine, a 1 cc. ampule of parathyroid extract weekly, and a combined anterior and posterior pituitary preparation were used. There seems to be a water retention problem also in this case of persistent obesity, and theocin seems to increase the output. All manner of diets have been used, including three trips to sanatoriums with weighed and measured diets and periods of fasting. The problem is how to bring the basal metabolism up to normal and keep it there. Any advice or suggestions will be much appreciated. Please omit name.

M.D., Florida.

ANSWER.—In a stubborn type of case such as this, the "ordinary reduction diet" may be a bit ambiguous. For every patient a sufficiently low caloric diet can be figured to secure reduction. The procedure advocated by Evans and Strang (*Am. J. M. Sc.* **177**:339 [March] 1929) of figuring the diet of the ideal instead of the actual weight for a person's given age and height and then reducing the fat to the minimum has been found by many workers to be an efficient reducing diet. In addition to such a low diet, the water balance must be carefully controlled and in some instances salt restriction is helpful. The most valuable endocrine product, of course, is thyroid or thyroxine, and this can be pushed to the point of a normal metabolism. It is doubtful whether the other endocrine glands have any real therapeutic value, although occasionally one sees reports of successful therapy following the combination of thyroid and some of the others. It should be understood that the diet by itself will probably not bring the metabolism up to normal, and even thyroid may not keep it there unless the thyroid is continued.

### THROMBO-ANGIITIS OBLITERANS

*To the Editor:*—In THE JOURNAL, August 29, appeared a query relating to the treatment of ulcers and gangrene in thrombo-angiitis obliterans. Although it is known that the treatment of this disease is not yet established on a definite basis, certain statements were made in the reply which deserve comment. The statement that "the most efficient means for increasing the amount of blood in the distal parts of the extremities is the use of fever" can be made only when it is compared with other methods which have been used by other investigators in this field. The commentator apparently has overlooked the fact that there are other methods of increasing the supply of blood in the extremities which do not have the disadvantages of fever. I might mention hypertonic saline solution intravenously, diathermy, hot sitz baths and postural exercises. That the use of typhoid vaccine in these cases is often attended with the danger of sudden thrombosis in previously patent arteries should not commend this form of treatment as a routine procedure. Such a reaction was reported by Barker of the Mayo Clinic in THE JOURNAL, September 19, in which thrombosis of the femoral artery occurred during the period of chill following the typhoid injection. Another case of thrombosis following the typhoid injection was reported by Allen and Smithwick in the *Journal of the Michigan State Medical Society* in January, 1929 (**28**:38). I have also seen a similar case of sudden thrombosis necessitating immediate amputation of the leg following a typhoid injection. Therefore it seems wrong to recommend this form of treatment as a routine procedure in view of the dangerous results one may encounter.

Another statement which deserves comment is the following: "If favorable results are not obtained with this method [typhoid injection] the prognosis is not good for the preservation of the limb." My experience with extensive gangrene convinces me that this statement is not accurate. I have seen at least three cases of extensive gangrene that have not responded to typhoid injections completely healed with simpler therapy. In each of these cases the oscillometric readings at each ankle were 0.

The statement that "if marked increase of surface heat occurs in the affected digit with fever, pain is relieved and healing of the ulcer is evident, consideration of lumbar sympathic ganglionectomy is indicated" seems somewhat inconsistent. If pain is relieved and the ulcer is healing, why submit the patient to an operation of such magnitude and risk if the local condition is improving without such an operation? One gains an impression from such a statement that a lumbar sympathectomy is a minor procedure and should be used in every case of thrombo-angiitis obliterans that shows signs of improving spontaneously. I cannot conceive of the logic of such a procedure. In other words, I wish to emphasize the fact that good results can be obtained with simpler methods, which should be tried before any major operative procedures are contemplated.

SAUL S. SAMUELS, M.D., New York.

# Council on Medical Education and Hospitals

## COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 11. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Clinical.* Chicago, Dec. 29. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Boston, Dec. 21. Sec., Dr. Wm. H. Wilder, 122 S. Michigan Blvd., Chicago.

ARIZONA: Phoenix, Jan. 5-6. Sec., Dr. B. M. Berger, 12 North Central Ave., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles and San Francisco, Dec. 16. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Jan. 5. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

DELAWARE: *Regular and Homeopathic.* Wilmington, Dec. 8-10. Sec., Dr. Harold Springer, 1013 Washington St., Wilmington.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, Dec. 29-30. *Regular.* Washington, Jan. 11. Sec., Dr. W. C. Fowler, District Bldg., Washington.

HAWAII: Honolulu, Jan. 11-14. Sec., Dr. James A. Morgan, Room 48, Young Bldg., Honolulu.

KANSAS: Kansas City, Dec. 8-9. Sec., Dr. C. H. Ewing, Larned.

LOUISIANA: New Orleans, Dec. 10-12. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MARYLAND: *Regular.* Baltimore, Dec. 8-11. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Dec. 17-18. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 5-6. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NEBRASKA: *Basic Science.* Lincoln, Jan. 12-13. Act. Sec., Mr. P. H. Bartholomew, Lincoln.

NORTH CAROLINA: *Endorsement.* Raleigh, Dec. 7. Sec., Dr. John W. MacConnell, Davidson.

NORTH DAKOTA: Grand Forks, Jan. 5-8. Sec., Dr. G. M. Williamson, Grand Forks.

OHIO: Columbus, Dec. 8-10. Sec., Dr. H. M. Platter, 85 E. Gay St., Columbus.

OREGON: Portland, Jan. 5-7. Sec., Dr. C. J. McCusker, 1014 Medical Dental Bldg., Portland.

RHODE ISLAND: Providence. Jan. 7-8. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

TENNESSEE: Memphis, Dec. 18-19. Sec., Dr. Alfred B. DeLoach, Medical Arts Bldg., Memphis.

VIRGINIA: Richmond, Dec. 8. Sec., Dr. J. W. Preston, 720 Shenandoah Life Bldg., Roanoke.

WASHINGTON: *Basic Science.* Seattle, Jan. 14-15. Dir., Mr. Charles Mayberry, Olympia.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 19. Sec., Prof. Robert N. Bauer, 3414 West Wisconsin Ave., Milwaukee. *Regular.* Madison, Jan. 12-14. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., LaCrosse.

### Oklahoma September Report

Dr. J. M. Byrum, secretary, Oklahoma State Board of Medical Examiners, reports the written examination held at Oklahoma City, Sept. 8-9, 1931. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. Two candidates were examined and passed. Eight physicians were licensed by reciprocity with other states. The following colleges were represented:

| College | PASSED | Year Grad. | Number Passed |
|---|---|---|---|
| University of Tennessee College of Medicine | | (1931) | 1 |
| University of Wisconsin Medical School | | (1930) | 1 |

| College | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|---|---|---|
| Georgia College of Eclectic Medicine and Surgery | | (1899) | Arkansas |
| Northwestern University Med. School | | (1899) | Illinois, (1922) Iowa |
| University of Louisville Medical Department | | (1921) | Kentucky |
| University of Louisville School of Medicine | | (1930) | Kentucky |
| Western Reserve University School of Medicine | | (1928) | Ohio |
| Memphis Hospital Medical College | | (1912) | Arkansas |
| Baylor University College of Medicine | | (1930) | Texas |

### Porto Rico September Examination

Dr. A. Ortiz Romeu, secretary, Porto Rico Board of Medical Examiners, reports the written and practical examination held at San Juan, Sept. 1-5, 1931. The examination covered 16 subjects and included 76 questions. An average of 75 per cent was required to pass. Ten candidates were examined, all of whom passed. The following colleges were represented:

| College | PASSED | Year Grad. | Per Cent |
|---|---|---|---|
| George Washington University School of Med. | | (1931) | 82.5, 89.6, 91.5 |
| University of Maryland School of Medicine and College of Physicians and Surgeons | | (1931) | 83.8, 85.7 |
| Long Island College of Medicine | | (1931) | 78.3 |
| Syracuse University College of Medicine | | (1931) | 82.2 |
| Meharry Medical College | | (1931) | 80.3 |
| Medical College of Virginia | | (1931) | 79.8 |
| University of Paris Faculty of Medicine | | (1928)* | 76.2 |

* Verification of graduation in process.

# Book Notices

**Yellow Fever: An Epidemiological and Historical Study of Its Place of Origin.** By Henry Rose Carter, M.D. Edited by Laura Armistead Carter and Wade Hampton Frost. Cloth. Price, $5. Pp. 308, with 5 illustrations. Baltimore: Williams & Wilkins Company, 1931.

Dr. Carter's wide experience with yellow fever in the American tropics, his long association with the epidemiologic problems which it has raised, and his profound scientific interest in these problems peculiarly fitted him to write this treatise, and his fitness was recognized by the International Health Board, which fortunately assisted him in its preparation. The book falls into three parts. The first and the one of greatest interest in public health deals with the epidemiology of the disease. The conditions requisite for the existence of yellow fever are the insect vector, Aedes aegypti, the causative organism, and susceptible men. The mosquito vector is the only species of the subgenus found in America. Its near relatives are African. Mosquitoes once infected seem to remain infective. Men remain infective to mosquitoes not over two weeks. Aedes aegypti has lived in the laboratory for five months. The vector mosquito is a commensal of man, and breeds in water of a wide amplitude of hydrogen ion concentration, preferably in wooden containers of small size, such as calabashes. It also breeds in water in footprints, cisterns, wells and small reservoirs. It avoids water where the margins are of earth, preferring earthenware or wood, and clear rather than muddy water. The temperature limits are 68-102, the optimum being 80-87 F. Hibernation occurs in the egg stage. Survival through the winter as far north as Norfolk, Va., is suggested. Evidence is conclusive that the causative organism has no host of sanitary importance other than man and the insect vector; that it has no free-living stage infective to man or to the mosquito; that man is infective to the vector for only a short time and does not become a carrier, and that he acquires immunity to the infection by the attack. Yellow fever is therefore spontaneously eliminated when no infective Aedes has access to susceptible men. The regions of endemicity are large towns and those areas of considerable susceptible immigration, such as Vera Cruz, Havana, Panama, and the West Coast of Africa. Aedes because of its commensalism with man has been widely distributed by shipping. Its temperature requirements restrict it between latitudes 38 north and 35 south, the main limiting factors being a winter minimum destructive to ova, and a summer minimum restricting reproduction. It has been known to survive, at least temporarily, as far north as Philadelphia and Cairo, Ill., and as far south as Tocapilla, Chile (latitude *22* south). Epidemic areas are thus created on the outer fringes of the central endemic areas of the tropics, by the agencies of human transport. The second part deals with the diseases that have or might have been confused with yellow fever, and have thus confused the history of epidemics in the past. The third part traces the origin of yellow fever to the West Coast of Africa on the basis of the history of disease in tropical America, especially in the records of exploration, conquest and settlement in Mexico, Yucatan and the West Indies, and the less satisfactory records of African exploration and travel. The biologic evidence consists of the high resistance of the Negro, as compared with the greater susceptibility of the American natives, to the effects of the disease, and the relative lack in the Americas of species of Aedes related to Aedes aegypti, as compared with their presence in Africa. The biologic evidence coincides with the historical; namely, that yellow fever evolved in West Africa as a disease of the Negro race.

**Röntgenstereoskopie bei Lungenkrankheiten.** Von Dr. W. Kremer, Dirigierender Arzt an den Beelitzer Heilanstalten und Leiter des Tuberkulosekrankenhauses, und Dr. W. Luedke, Assistenzarzt am Tuberkulosekrankenhaus der Beelitzer Heilanstalten. Nr. 40. Tuberkulose-Bibliothek. Beihefte zur Zeitschrift für Tuberkulose. Herausgegeben von Prof. Dr. Lydia Rabinowitsch. Paper. Price, 3.75 marks. Pp. 35, with 23 illustrations. Leipzig: Johann Ambrosius Barth, 1931.

The authors discuss briefly the various methods employed in x-ray work for determining depths. The bulk of the pamphlet is devoted to stereoscopic technic. Attention is called to the fact that many individuals, including physicians, cannot see stereoscopically. Various devices are described. Efforts to be able to read "depths" into book illustrations are supposedly

crowned with success in the so-called anaglyph process. The principle is to prepare two positives from the stereo negatives and to reduce them to the desired size. One is colored red, the other green. One is printed over the other and the picture is viewed with red-green spectacles; each eye sees only one picture, thus obtaining stereoscopic effect. Certain precautions are necessary in viewing the pictures. Attention is called to the fact that each picture should be viewed for at least five minutes. A brief atlas illustrates eight cases in which pathologic changes in the lungs may be observed stereoscopically with the aid of paper spectacles that accompany the book. This method has not been satisfactory; it certainly does not compare with the effect obtained with a regular stereoscopic apparatus.

**The Causation of Chronic Gastro-Duodenal Ulcers: A New Theory.** By J. Jacques Spira, M.R.C.S., L.R.C.P. With an introduction by Sir Humphry Rolleston, Bart., G.C.V.O., K.C.B., Physician in Ordinary to H. M. The King. Cloth. Price, $2.50. Pp. 78. New York: Oxford University Press, 1931.

The author presents a new theory of the causation of peptic ulcer. In all the previous discussions on the etiology of ulcer formation, the factor of food was not considered, except so far as the simple points that it must be well comminuted and that it must prevent the formation or reduce the amount of free hydrochloric acid. He brushes aside the many theories presented by showing the lack of value of any of these in the treatment. Gastro-enterostomy is followed by a high percentage of gastrojejunal ulcer, and resection is fraught with too high a mortality. He states from his perusal of the literature that fats delay digestion and at first depress but later increase the secretion of gastric acidity. Bile has no function in reducing acidity. Quoting some recent work of MacLean, he further states that duodenal regurgitation has on the whole no influence on gastric acidity. Bile is a definite gastric irritant but is harmless in the absence of a high gastric acidity. Fat in the stomach delays gastric emptying, increases gastric acidity, provokes duodenal regurgitation into the stomach, and, as bile is an irritant of the pyloric mucosa, it causes pylorospasm and hypertonus. Here, then, are all the factors necessary to produce ulcers, of which the combination of hyperchlorhydria and the presence of bile are the worst offenders. The occurrence of ulcers in several members of one family is not due to heredity or constitution but to the same food factors. Seasonal variations in ulcers are due likewise to food factors. More fat is consumed in the cold seasons. The author cites many case reports in which, on lowering the intake of fat, the patients made an extraordinarily rapid recovery. He says that any one comprehending the rationale of the theory can master the basic principles that will guide him in the choice of foods. This is an ingenious theory. There is too much contradictory evidence for the acceptance of the basic principles as a fact. The author seems to accept the evidence that fits in with his theory. Clinical experience with a large number of patients by many physicians will after all decide the validity of the claims of the author.

**Hay-Fever, Hay-Asthma: Its Causes, Diagnosis and Treatment.** By William Lloyd. Third edition. Cloth. Pp. 124, with illustrations. London: Straker Brothers, Ltd., 1931.

This little volume is written by a nose and throat specialist with more than thirty years of experience. The first and second editions appeared in 1907 and 1908, and a perusal of the third edition shows that the author has changed his ideas little, if at all. He treats all his hay fever patients with electrocautery or chemical cautery of "hypersensitive" areas in the nose, and he states that he cures most of them and relieves practically all whom he does not cure. He has twenty-six case reports, almost all with "cures." Many of these cases occurred in 1905, 1906 and 1907, yet the author does not state the condition of any patient for a period longer than three years. Are they still free from symptoms or did they relapse? The author is silent on this most important point, a silence which does not highly recommend the cautery treatment he advocates. He has apparently not kept up with the tremendous advances in allergy, giving little space to these and hardly mentioning skin tests at all. He writes not a word about pollen extract injections but stresses the poor results from Dunbar's Pollantin, long since abandoned by almost every one. He speaks a little about hay fever in America but believes it is due to "Indian Corn and the Roman Wormwood"; he does not even mention ragweeds. There are two excellent illustrations and the description of symptomatology is good. The book is disappointing.

**Demonstrations of Physical Signs in Clinical Surgery.** By Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital, London. Third edition. Cloth. Price, $6.50. Pp. 277, with 318 illustrations. New York: William Wood & Company, 1931.

Because of a growing tendency on the part of the modern graduate in medicine to depend on laboratory and other auxiliary reports for a diagnosis, the author has attempted to point out the importance of physical signs in surgical diagnosis. Basic physical signs are first described. There is a general chapter on tumors, ulcers, fistulas and cellulitis. The various regions of the body are considered separately; the common surgical conditions, including injuries, are discussed, and a method of diagnosis of each condition is given through some physical signs or methods of examination which may be quite characteristic. There is a special chapter on gangrene and surgical diseases of the bones, spine and peripheral nerves. Numerous and excellent photographs of the methods of examination accompany the discussion in the text, which is brief and limited to the important points. While the importance of a good history is not overlooked, the author particularly stresses the necessity of a thorough knowledge of anatomy and pathology, together with clinical experience. The book offers a fascinating review of surgical conditions and demonstrates that the art of surgical diagnosis is based on scientific knowledge.

**Les infections humaines à bacilles parathyphiques aberrants.** Par le Dr. Marcel Monnerot-Dumaine, diplomé de l'Institut de Médecine Coloniale. Travail du service du Professeur P. Teissier (clinique des maladies infectieuses). Paper. Pp. 132. Paris: Jouve & Cie, 1930.

The main purpose of this book seems to be to call attention to the importance of the relatively unusual or, as the author terms them, the aberrant paratyphoid bacilli. The numerous varieties that have come to be recognized in addition to the classic A (now Salmonella paratyphi) and B (S. schottmülleri) types constitute a bewildering tangle of names and characteristics and certainly need to be standardized and analyzed in orderly fashion. This author has not sufficiently appreciated the magnitude of his task; while he has made some attempt at precise description and differentiation, he has not succeeded in understanding and defining the group nearly as well as Bruce White has done in England or Kauffmann in Germany. Perhaps the most valuable part of the work is the description of several clinical cases observed in a Paris hospital in which S. hirschfeldi ("para C") was isolated.

**The Modern Therapeutics of Internal Diseases: An Introduction to Medical Practice.** By A. P. Cawadias, O.B.E., M.D., M.R.C.P. Cloth. Price, $3.75. Pp. 147. New York: William Wood & Company, 1931.

The author believes that we are emerging from an age of therapeutic nihilism and of the apotheosis of bacteriology, pathology and diagnosis that characterized the school of medicine of the nineteenth century, which was largely a meditation on death, into an age characterized by an active healing art. As Albert Robin says: "Scepticism regarding treatment can no longer be considered as a sign of high critical intelligence, but of deep medical ignorance." The essential feature of contemporary medicine is the synthetic movement, which considers and treats the patient as a whole rather than a single organ or disease. The statement "there are no diseases but only diseased individuals" or "every diseased individual represents a chain of morbid events" is merely another way of emphasizing the maxim that it is the patient, not the disease, that is the proper object of treatment. The author does not recognize a separation between diagnosis and therapy. Both are essential parts of treatment; for not only must diagnosis precede therapy but it must constantly accompany it to determine what effect the therapy had and what should be done next. Diagnosis is merely the first phase of treatment, and therapy the second phase. "As the true diagnosis of every morbid condition in internal medicine is bound to discover an extremely complicated process, so the therapy cannot be single or simple but must be a constellation of therapeutic factors, in which, according to their particular indications, psychic, dietetic, chemic, biologic and physical agents may take part, a constellation that varies for each patient and for the same patient according to changes in his condition." Enough, it seems, has been quoted here to show that this book

could be read with profit by medical teacher, specialist, general practitioner and student alike. The teacher, especially in these days when "research men" are so much in demand in medical schools, should digest such dicta as "the purpose of medicine is not to know but to cure" and "the research physician must abandon his theories with his overcoat before he enters the patient's ward." Narrow specialisms in the domain of internal medicine are held up to scorn. It is the diseased individual, not a diseased stomach or heart, that is the object of treatment. "It must be emphasized, however, that most distinguished contemporary narrow specialists are really complete internists, to whom a narrow specialistic label has been given by the public."

**Anatomie pathologique.** Par Maurice Letulle, professeur honoraire à la Faculté de médecine de Paris. Avec la collaboration de L. Nattan-Larrier, professeur au Collège de France, et A. Jacquelin, médecin des Hôpitaux de Paris, L. Duclos, ophthalmologiste adjoint de l'Hôpital Chirurgical Gouin, E.-P. Normand, conservateur du musée d'anatomie pathologique générale Maurice-Letulle (Hôpital Boucicaut). Tomes I, II et III. Cloth. Price, 600 francs per set. Pp. 2346, with 843 illustrations. Paris: Masson & Cie, 1931.

These three heavy volumes (together they weigh more than 15 pounds) are said to represent half a century of labor and research. Professor Letulle completed the manuscript a few weeks before his death and in his will expressed the wish that his son, Raymond Letulle, and his collaborator, E.-P. Normand, attend to its publication. Volume I is a revision and enlargement of the "Anatomie pathologique, Tome I," published by Letulle and Nattan-Larrier in 1914. About half of this volume deals with general pathology. Pages 1 to 88 contain a discussion of inflammation, under which are included degenerations, necrosis, atrophy and other conditions as parts of the inflammatory process. The following 235 pages are devoted to tumors, the classification of which is somewhat more detailed and elaborate than that found in American textbooks of pathology. Special pathology occupies the last half of volume I and the whole of volumes II and III. The last chapter deals with the pathology of the eye. This extensive work is pure descriptive pathologic anatomy with little or no attempt at correlating anatomic changes with alterations of function, clinical symptoms or variations in chemical composition and chemical activity of diseased organs. Descriptions of the various lesions are clear and abound in minute detail as to changes in shape, color, consistency and texture. Many pathologic processes are elaborated into numerous types. This very abundance of detail may be confusing. The descriptions of microscopic changes are done in similar fashion and are, on the whole, well illustrated in black and white. The legends beneath the drawings are full, and significant and characteristic features are designated by lines to letters in the margins. These illustrations and their accompanying legends are as enlightening as the more extended descriptions in the text. There is considerable variation in the amount of space allotted to the special pathology of different organs and diseases. This apportionment does not appear always to have been governed by the relative importance of the subject. Discussion of syphilis of the different organs is especially exhaustive. For example, sixty pages are devoted to syphilis of the lungs and the pleura. There are also significant omissions. The pathology of bones and joints is not discussed. Rheumatism is considered only in its effects on the heart and other organs. Most of the infectious granulomas, including actinomycosis, are fully described, but blastomycosis and tularemia are not mentioned. The chapter on the central nervous system is brief, and such important diseases as tabes and poliomyelitis are not mentioned. Numerous interesting items appear in footnotes. The bibliography is scanty and is limited almost entirely to contributions of the author (Letulle). The pages are numbered consecutively through the three volumes. At the end of volume III are one page of errata, twenty-one pages of index, and eleven pages of an analytic table of contents. Three general criticisms may be offered on these volumes: The treatment of the various subjects is essentially dogmatic; there is a tendency to differentiate pathologic processes into unnecessarily numerous and rigid types, and confusion may result from the superabundance of detail in classification and in objective description. But, in spite of these general criticisms, as an example of purely descriptive pathologic anatomy this is truly a monumental work.

**Personal Hygiene Applied.** By Jesse Feiring Williams, A.B., M.D., Professor of Physical Education, Teachers College, Columbia University. Fourth edition. Cloth. Price, $2.25. Pp. 520, with 145 illustrations. Philadelphia and London: W. B. Saunders Company, 1931.

This book has demonstrated its usefulness in three preceding editions. The author is unusually well fitted for writing on this topic by a background and experience which include a sturdy body, a keen mind and wholesome health habits; an honest and optimistic outlook on life; a more than superficial knowledge of philosophy and education; a thorough knowledge of physical education; a sound medical training and continued wide reading on medical subjects; a taste for friends and play and rest, and an appreciation of their value; and, finally, long and successful experience in teaching hygiene and in writing about it. These advantages coupled with a clear and pungent style would be almost certain to produce a book such as this is, readable, dependable and helpful. With the addition of intelligent questions at the end of each chapter and the revision which brings it down to date, it becomes as good a book as is available for class use in teaching hygiene and an excellent one for general use in homes. One feature that is unusual in such books is the frank and fearless treatment of various fads and fancies in this field. Probably the faddists do not like the book.

**Der geburtshilfliche Phantomkurs für Ärzte und Studierende.** Von Universitäts-Professor Dr. med. Wilhelm Liepmann, Direktor des Deutschen Instituts für Frauenkunde und der Frauenklinik „Cecilienhaus." Second edition. Paper. Price, 8 marks. Pp. 317, with 172 illustrations. Berlin and Vienna: Urban & Schwarzenberg, 1931.

This edition of Liepmann's manikin course is chiefly a reprinting of the first edition, which appeared in 1922. A description of the use of the Kjelland forceps and a number of new illustrations have been added, and the text has been somewhat revised. The pen drawings are especially well adapted to this kind of book. Teachers of obstetrics, as well as students, will find it a valuable work of reference. To the practitioner it will be found suitable for a home course in operative obstetrics.

**Surgical Pathology of the Genito-Urinary Organs.** By Arthur E. Hertzler, M.D., Surgeon to the Agnes Hertzler Memorial Hospital, Halstead, Kansas. Hertzler's Monographs on Surgical Pathology. Cloth. Price, $5. Pp. 286, with 222 illustrations. Philadelphia: J. B. Lippincott Company, 1931.

This is a subtle mixture of much personal experience and a moderate amount of description of gross and microscopic pathologic observations. The illustrations are good. It is evident that the author belongs to the fast passing school of general surgeons who find it difficult to recognize the group of workers known as urologists. This is shown particularly by the omission of some of the best recent bibliographic lists at the end of each chapter. The author is to be complimented on his clear discussion of tumors of the testis. His contention that small fibrosed prostates and prostatic bars are not related to pass infection certainly cannot be supported. Also, his belief that any prostate gland which can be shelled out with the unaided finger is not malignant is refuted by the finding of small carcinomatous areas in the deep portions of many removed glands. He is an enthusiastic supporter of perineal prostatectomy because he believes that the easy suprapubic route causes disinterest in the underlying pathologic changes. His views on urinary lithiasis are individual indeed. He derides the understanding of the chemical structure of stones on the ground that such facts cannot be of any possible value to the surgeon: in his mind, diet plays no part in the control of the formation of urinary stones. He advocates surgical intervention on all bilateral kidney calculi and terms the surgeon a coward who refuses to operate in such cases. The book contains many ideas diametrically opposed to what most urologists agree to be correct.

**A Review of Certain Aspects of the Control of Cerebro-Spinal Fever in Relation Particularly to a Scheme for Collecting the Results of Serum Treatment.** Ministry of Health, Reports on Public Health and Medical Subjects, No. 65. Paper. Price, 6d. Pp. 23. London: His Majesty's Stationery Office, 1931.

The object of this brief memorandum is to put into the hands of British health officials and others a concise summary of current opinion about the public health aspects of cerebrospinal fever (epidemic meningitis). The increase of this disease in Great Britian in 1931 and the desirability of obtaining reports on the result of serum treatment are the main reasons for issuing the statement at this time.

# Medicolegal

## Homeopathic Vaccination and School Attendance

*(Allen et al. v. Ingalls et al. (Ark.), 33 S. W. (2d) 1099)*

The school board of Eureka Springs special school district, under authority conferred on it by statute, made a rule requiring as a prerequisite to school attendance the presentation of satisfactory evidence of having been successfully vaccinated, or of having had smallpox, or of immunity to it, or of physical disability sufficient to excuse from compliance with the rule. The state board of health had defined "vaccination" as "the introduction, by scarification, of the bovine vaccine virus through the skin." Two children of one of the petitioners presented to the school board a certificate from a homeopathic physician, averring that he had vaccinated them against smallpox. This certificate the school board refused to accept. It permitted other children, however, to attend school without restriction on the presentation of certificates of vaccination issued by other physicians. Certain persons, including the parents of the two excluded children, thereupon instituted mandamus proceedings to compel the admission of these children and of five or six others who had been excluded. The homeopathic physician whose certificate had been rejected sought and obtained permission to intervene in the suit. The circuit court refused to issue the writ, and thereupon the petitioners appealed to the Supreme Court of Arkansas. The Supreme Court affirmed the judgment of the circuit court in favor of the school board.

The homeopathic physician whose certificate of vaccination the school board rejected testified that he had issued the certificate on the day on which he "gave the medicine and performed the vaccination." He described the method used by him, sometimes known as the homeopathic method, which the school board had refused to accept on the ground that it did not meet the requirements of the law and the rules of the state board of health. The homeopathic physician complained that the action of the school board was arbitrary and unwarranted, an attempt to regulate the practice of medicine, an interference with the right of citizens to employ practitioners of their choice, and contrary to the provisions of the statute under which the state board of health made its rules. The petitioners insisted that the state board of health exceeded its power in requiring vaccination and prescribing the method in which it should be performed; that the certificate of the physician that the children had been vaccinated was conclusive so far as the school board was concerned; that the vaccination requirement of the school board was arbitrary, unreasonable and unnecessary, and since it applied only to school children was discriminatory and void, and that it was in effect an unwarranted attempt to regulate the practice of medicine, and contrary to the provisions of the statute authorizing the making of health regulations by the state board of health.

It is well settled, said the Supreme Court, that it is a valid exercise of the police power of the state of Arkansas to authorize local boards of health to require under penalty the vaccination of all citizens when it is deemed necessary for the public health and safety, such necessity arising when smallpox is present in a community or its appearance reasonably apprehended. There was no smallpox in Eureka Springs nor in the county when the appellants' children were denied the right to attend the public schools, which they were entitled to do except for their failure to present satisfactory certificates of vaccination. The testimony showed furthermore that there was no condition existing at the time from which the appearance of smallpox could be reasonably apprehended. The present case, however, said the court, was not distinguished from *Brazil* v. *State*, 134 Ark. 420, 204 S. W. 622, 625, where a like condition was shown to exist and the adoption and promulgation of a rule like the one under consideration in the present case was held to be neither unreasonable nor unnecessary.

It is true, said the court, that there is no definition of the term "vaccination" in the statute granting authority to the state board of health, although there is no doubt that the legislature had authority to prescribe the method to be used by the state board in the protection of the public health when necessity arose. The majority of the court was of the opinion that the power to prescribe the method to be used for vaccination against smallpox was granted by implication by the statute granting powers and prescribing the duties of the state board of health and that the regulation made by the board prescribing the method for vaccination was not arbitrary but only a reasonable exercise of the power thus granted. The prescribed method of vaccination was in any event but a statement of the meaning of the term "vaccination" in accordance with the common knowledge of mankind and as understood by the consensus of opinion of the medical profession and practiced by a great majority of it. The term "vaccination" itself means the method of vaccination as it was defined by the state board of health, as effectually as if it had been so defined by the statute.

The majority of the court was moreover of the opinion that the school board did not abuse its discretion in requiring as a prerequisite to the entry of pupils into the public schools, the presentation of a certificate from a licensed and competent physician of the state that the pupil had been successfully vaccinated in accordance with the rules prescribed by the state board of health, and that the school board was not concluded by the certificates of vaccination presented by the pupils from licensed physicians but could inquire into the method used in performing vaccinations and deny children the right to enter school if vaccination had not been performed by the method prescribed by the state board of health.

**Insanity: Insanity of Near Relatives as Evidence of.**—In an effort to show the lack of testamentary capacity in the testator, the plaintiffs in error offered to prove that his brother had been adjudged of unsound mind and had died in an insane asylum. The defendant objected on the ground that it was immaterial and that no proper basis had been laid for such evidence, because it had not been shown that the insanity from which the brother suffered was of an hereditary nature. These objections were sustained by the trial court, and the proffered evidence excluded. The commission of appeals of Texas, section B, found that the excluded evidence was material to the issue as to the testator's sanity and should have been admitted. While the insanity of immediate relatives of a person does not prove that he is insane, yet it is corroborative of independent testimony to that effect and should always be received to be considered for such purpose. This finding of the commission of appeals was approved by the Supreme Court of Texas.—*Ramon v. Worsham (Texas), 35 S. W. (2d) 699.*

**Workmen's Compensation Acts: Trauma and Disease of the Kidneys.**—The plaintiff suffered from a disease of the kidneys. The evidence showed that that disease might result from causes other than trauma. The evidence conclusively established, however, that prior to the accident complained of the plaintiff was in good health and able to work and that immediately thereafter he was unable to work and that his disability had continued. Physicians testified that the fall sustained by the plaintiff was sufficient to injure his kidneys. The court was of the opinion, in the absence of any proof of an intervening cause, that the accident was the proximate cause of the plaintiff's disability.—*Gough v. Urania Lumber Co., Ltd. (La.), 132 So. 393.*

# Society Proceedings

## COMING MEETINGS

Association of American Medical Colleges, New Orleans, November 30-December 2. Dr. Fred C. Zapffe, 25 East Washington Street, Chicago, Secretary.

Association of Military Surgeons of the United States, New Orleans, November 30-December 2. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Philippine Islands Medical Association, Manila, December 15-18. Dr. A. S. Fernando, 817 Taft Avenue, Manila, Secretary.

Radiological Society of North America, St. Louis, November 30-December 4. Dr. I. S. Trostler, 25 East Washington Street, Chicago, Secretary.

Society of American Bacteriologists, Baltimore, December 28-31. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Southern Surgical Association, White Sulphur Springs, W. Va., December 8-11. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, Denver, December 4-5. Dr. Frank R. Teachenor, 306 East Twelfth Street, Kansas City, Mo., Secretary.

# Current Medical Literature

## AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

### Alabama Medical Association Journal, Montgomery

**1:** 137-184 (Oct.) 1931

Management of the Epilepsies. W. A. Smith, Atlanta.—p. 137.
Encephalitis. W. S. Littlejohn, Birmingham.—p. 145.
Etiologic Diagnosis and Treatment of Four Cases of Heart Disease. W. S. Hannah, Montgomery.—p. 150.
Acute Appendicitis in General Practice: High Mortality and Bad Management. W. F. Jordan, Huntsville.—p. 153.

### American Journal of Ophthalmology, St. Louis

**14:** 999-1100 (Oct.) 1931

Some Afterthoughts on Trephining for Glaucoma. R. H. Elliot, London.—p. 999.
*Cataract and Other Ocular Changes in Vitamin G Deficiency: Experimental Study on Albino Rats. P. L. Day, W. C. Langston, Little Rock, and C. S. O'Brien, Iowa City.—p. 1005.
*Spontaneous Extrusion of Intra-Ocular Foreign Bodies. E. M. Blake, New Haven, Conn.—p. 1009.
Use of Fascia Lata in Extensive Keratocele. H. M. Emmons, Boston.—p. 1014.
*Epinephrine in Progressive Myopia: 2. Phase of Ocular Tension. L. L. Mayer, Chicago.—p. 1015.
Effect of Relation to Background on Size and Shape of Form Field for Stimuli of Different Sizes. C. E. Ferree and Gertrude Rand, Baltimore.—p. 1018.
*Relation of Parathyroid Gland to Cataract. E. I. Evans and Ruth Kern, Chicago.—p. 1029.
Accidental Vaccination of Eyelids. G. F. Munns, Winnetka, Ill.—p. 1037.
A Month's Service with Dr. Holland at Shikarpur, India. A. E. Edgerton, Philadelphia.—p. 1039.

**Ocular Changes in Vitamin G. Deficiency.**—Day and his associates noted that in a series of forty-eight young albino rats, receiving a diet deficient in vitamin G, bilateral cataracts developed between the sixtieth and eighty-seventh days in all but three of the thirty-seven rats that survived. One of the three developed unilateral cataract and was placed on vitamin G immediately, after which there were no further lens changes; the other two rats were killed before the maximum time of expectancy for the appearance of lens changes. It appears that the absence of vitamin G was the sole cause of the cataracts and other ocular changes, since the further progress of such changes was stopped immediately by the feeding of autoclaved yeast with its high vitamin G content.

**Spontaneous Extrusion of Intra-Ocular Foreign Bodies.**—Blake reports two cases in which fragments of copper wire had penetrated the eyeball and remained in it for long periods, after which they migrated forward and came through the iris and corneal limbus to be removed from the subconjunctival space. A study of the literature reveals that neither the shape nor the material of the foreign body is the determining factor in such migrations. The movement is forward in all cases.

**Epinephrine in Progressive Myopia.**—Mayer determined the effect of epinephrine solutions of varying concentrations on the tension of the eyes of ten normal individuals by tonometric measurements at short intervals after instillation of 3 minims (0.2 cc.) into the conjunctival sacs. All dilutions produced a fall in tension of from 2 to 3 mm. of mercury during the second to fifth minute with a return to previous level by the tenth minute. The patients had no discomfort from these procedures.

**Relation of Parathyroid to Cataract.**—Evans and Kern present analytic data on the quantity of water, calcium, magnesium, potassium, phosphorus and silicon in the normal lens (dog) and "parathyroid" cataractous lens (dog) and compare them with other data on the subject. That there is an increase in calcium and a decrease of potassium in the parathyroid cataractous lens seems to be established with close correlation with senile cataract changes. Data on oxygen consumption at 20 C. of cataractous and normal lens (dog) are given, together with a discussion of their significance. Because of the apparent correlation of existing data on the two types of cataract, the authors feel that serious consideration should be given to parathyroid dysfunction in the etiology of senile cataract.

### American Journal of Pathology, Boston

**7:** 423-579 (Sept.) 1931

*Implantation Peritoneal Carcinomatosis of Ovarian Origin. J. A. Sampson, Albany, N. Y.—p. 423.
Topographic Anatomy and Histology of Values in Human Heart. L. Gross and M. A. Kugel, New York.—p. 445.
Avian Tuberculosis in Normal and Vaccinated Rabbits. E. M. Medlar, Mount McGregor, N. Y.—p. 475.
*Significance of Lesions Resembling Hodgkin's Disease in Tuberculosis. E. M. Medlar and K. T. Sasano, Mount McGregor, N. Y.—p. 491.
*An Interpretation of the Nature of Hodgkin's Disease. E. M. Medlar, Mount McGregor, N. Y.—p. 499.
Investigation of Spirochetosis of Dental Anlage in Congenital Syphilis. T. J. Hill, Cleveland.—p. 515.
Inflammatory Adenomatoid Hyperplasia of Major Duodenal Papilla in Man. V. J. Dardinski, Rochester, Minn.—p. 519.
Effect of Testis Extract on Rous Sarcoma. D. C. Hoffman, F. Parker, Jr., and T. T. Walker, Boston.—p. 523.

**Implantation Peritoneal Carcinomatosis.**—Sampson presents the evidence that implantation peritoneal carcinomatosis of ovarian origin is nothing more than the result of the repair of injuries to the peritoneum caused by cancer cells that have escaped from ovarian tumors into the peritoneal cavity and lodged on the surface of its serous membrane, together with the continued growth of these cells in this situation. The various stages in this repair, as well as the laws governing it, are similar to those encountered in the repair of tissues injured by foreign bodies and in the taking of skin grafts—namely, the healing of wounds. The histologic structure of these implants varies with the reaction of the peritoneal tissues before and after the fixation of the cancer cells and the activity of the latter. As a result cancer becomes embedded in the peritoneal scar, encapsulated on its surface, enmeshed in adhesions, or, like the epithelial growth of a successful skin graft, spreads over the peritoneum without encapsulation. The malignant cells of these metastatic tumors possess the same potentialities of invasion and dissemination as those of a primary cancer.

**Lesions Resembling Hodgkin's Disease.**—According to Medlar and Sasano, lesions resembling Hodgkin's disease are often present in acute tuberculous foci. These lesions are simply the accumulation of megakaryocytes that have emigrated from the bone marrow to the areas of damaged tissue. They are not true Hodgkin's lesions. The participation of the megakaryocyte in an acute tuberculous process is emphasized. This is not specific for tuberculosis, since it occurs in other pathologic conditions. The necessity of exercising care in the diagnosing of Hodgkin's disease from tissue sections is stressed. The presence of the Sternberg type of giant cell in tissue is not sufficient evidence to warrant a diagnosis of Hodgkin's disease. Various types of virulent tubercle bacilli cause the production of the lesions which simulate Hodgkin's disease. This would seem to preclude the possibility that any one type of tubercle bacillus is the etiologic agent of Hodgkin's disease. Lesions suggestive of Hodgkin's disease have been observed only in acute tuberculosis. In chronic tuberculosis these lesions have not been encountered.

**Nature of Hodgkin's Disease.**—Medlar presents evidence which suggests that Hodgkin's disease is a malignant condition of the bone marrow. The type cell appears to be the megakaryocyte. The developmental cycle of the megakaryocyte is described. It would seem that the typical megakarocyte is the result of fusion of several premegakaryocytes. The histopathology of Hodgkin's disease is a pleomorphic aggregation of cells which represent the developmental cycle of the megakaryocyte. It is not essential to have fibrosis or eosinophilic or neutrophilic infiltration to establish the diagnosis of Hodgkin's disease. The involvement of lymph nodes and other tissue outside the bone marrow appears to be metastatic tumor growth. Evidence is presented which tends to prove that all blood cells arising from the marrow have a common parent cell. The term "megakaryoblastoma" is suggested to designate true Hodgkin's disease.

## Annals of Surgery, Philadelphia

94: 481-800 (Oct.) 1931

Address of the President: Study in Records. A. Primrose, Toronto.—p. 481.
Reconstructive Operations for Jejunal Ulcer. D. C. Balfour, Rochester, Minn.—p. 489.
*Calcium Carbonate Gallstones and Calcification of Gallbladder Following Cystic Duct Obstruction. D. B. Phemister, A. G. Rewbridge and H. Rudisill, Jr., Chicago.—p. 493.
Gastric Ulcers Dependent on Diaphragmatic Hernia. F. S. Mathews and W. MacFee, New York.—p. 517.
Tumors of Diaphragm. H. Binney, Boston.—p. 524.
Symptoms and Physical Signs Indicating Hernia of Diaphragm with Report of Twelve Cases Treated by Operation. P. E. Truesdale, Fall River, Mass.—p. 528.
*Present Status of Treatment of Tuberculosis of Cervical Lymph Nodes. T. H. Miller, Boston.—p. 539.
Paracelsus. F. B. Lund, Boston.—p. 548.
Case of Thyroiditis Simplex (Reidel's Tumor). H. A. Bruce, Toronto.—p. 562.
Thyroid Surgery at Portland Clinic. T. M. Joyce, Portland.—p. 563.
End-Results of Thyroidectomy. F. A. Coller and E. B. Potter, Ann Arbor, Mich.—p. 568.
Progressive Exophthalmos Following Thyroidectomy: Pathology and Treatment. H. C. Naffziger, San Francisco.—p. 582.
Electrosurgery with Especial Reference to Goiter and Malignancy. M. B. Tinker, Ithaca, N. Y.—p. 587.
Parathyroidism and Parathyroidectomy. M. Ballin and P. F. Morse, Detroit.—p. 592.
Resection of Cecum. F. N. G. Starr, Toronto.—p. 610.
Surgical Treatment of Tuberculoma of Cecum. H. H. Kerr, Washington, D. C.—p. 612.
Diverticulitis of Colon: Report of Thirty-Six Cases from New York Hospital. F. Conway and J. M. Hitzrot, New York.—p. 614.
Bacteriophage in Surgery of Colon and Rectum. E. Rixford, San Francisco.—p. 640.
*Diverticulitis and Sigmoiditis. C. Eggers, New York.—p. 648.
Treatment of Megacolon by Sympathectomy. D. E. Robertson, Toronto.—p. 670.
*Total Colectomy: Its Indication and Technic. F. W. Rankin, Rochester, Minn.—p. 677.
Choice of Operation in Carcinoma of Colon. D. Cheever, Boston.—p. 705.
Intestinal Obstruction from Carcinoma of Colon. W. D. Haggard, Nashville, Tenn.—p. 717.
Surgery of Large Intestine. W. J. Mayo, Rochester, Minn.—p. 722.
*Action of Sodium Chloride on Small Intestine. T. G. Orr, Kansas City, Kan.—p. 732.
Spinal Anesthesia. G. P. Muller and R. H. Overholt, Philadelphia.—p. 738.
Clinical Experiences with Gwathmey's Colonic Oil-Ether Anesthesia. H. H. M. Lyle, J. T. Gwathmey and L. Watter, New York.—p. 751.
*Results of Splenectomy in Splenic Anemia, Hemolytic Jaundice, and Hemorrhagic Purpura. J. deJ. Pemberton, Rochester, Minn.—p. 755.
Abscess of Liver. F. K. Boland, Atlanta, Ga.—p. 766.
*Selective Surgical Treatment of Diaphragmatic Hernia. C. A. Hedblom, Chicago.—p. 776.
Late Results of Surgical and Medical Treatment of Chronic Cholecystitis. J. T. Mason, Seattle.—p. 786.
Tuberculosis of Esophagus: Report of Case Without Active Tuberculosis Elsewhere. F. Torek, New York.—p. 794.

**Calcium Carbonate Gallstones.**—According to Phemister and his associates, obstruction of the cystic duct or neck of the gallbladder by one of the common gallstones or by a carcinoma may be followed by the precipitation within the gallbladder of large amounts of calcium carbonate in the form of a soft, white stone, a paste or a milky suspension (lime-water bile). Obstruction, although it may be incomplete or intermittent, appears to be necessary for the occurrence of the process. The calcium carbonate is thrown out in the presence of a mild chronic cholecystitis rather than a severe acute cholecystitis, and it appears to come from the wall of the gallbladder. There may also be deposition of calcium carbonate on the stone in the cystic duct and particularly on its gallbladder side making it possible to diagnose both the calcium carbonate deposit in the gallbladder and the duct obstruction by means of roentgenograms. Obstruction of the cystic duct by one of the ordinary gallstones may in other cases be followed by degeneration, fibrosis and calcification of the wall of the gallbladder. In such cases there is also calcification of the cystic duct about the stone with fusion of the surfaces of stone and duct. If the gallbladder is contracted on a mass of stones there may be calcification with cementing of the stones to the wall of the gallbladder and to a less extent to one another. When the gallbladder is found calcified in the absence of a stone in the cystic duct, the duct is found obliterated by fibrous tissue at its cystic end. It should be remembered that while these two pathologic processes are closely related they are in reality separate biochemical changes. The calcium carbonate deposition in the lumen belongs in the realm of stone formation, while the calcium phosphate-calcium carbonate deposition in the gallbladder wall belongs in the realm of tissue calcification.

**Tuberculosis of Cervical Lymph Nodes.**—Miller calls attention to the fact that lymphatic tuberculosis in the neck is slowly disappearing as a result of proper elimination of infected cows, proper pasteurization of milk, and the widespread and increasing custom of removing children's tonsils and adenoids. These measures are of untold prophylactic value. Cervical tuberculosis is, in many instances, a primary focus of disease, a focus from which bacilli may be, and soon are, carried into the general circulation. Cervical nodes furnish one of the few instances in which the primary focus of tuberculosis can early be seen, felt and extirpated, without damage to the patient. The author believes that when these nodes are discrete, when the technical difficulties of operation are not insuperable, and when there is no active pulmonary or general disease, radical excision should be given serious consideration as the treatment of choice.

**Diverticulitis and Sigmoiditis.**—On the basis of a group study of acute sigmoiditis and diverticulitis, Eggers calls attention to the seriousness of this condition. The study reveals that diverticulosis, as such, is not an innocuous lesion. Once recognized in a patient, the physician or surgeon assumes a serious responsibility if he allows the patient to depart without warning him of possible danger and instructing him in the available means to avoid complications. It is difficult to imagine a group of patients that tax a surgeon's judgment, ability and patience to a greater degree than complicated cases of diverticulitis.

**Total Colectomy.**—Rankin stresses the advantages of graded removal of the large bowel and rectum when its extirpation is necessary, and emphasizes the thought that polypoidosis, and particularly the congenital variety, is a potentially malignant condition which warrants radical measures before metamorphosis into carcinoma has taken place. As for the other indication for resection, complicated chronic ulcerative colitis, it is evident that the question of focal infection must be a very urgent one before such radical surgical measures can be undertaken, but here, too, polypoidosis or pseudopolypoidosis, whichever one chooses to regard it, unquestionably is a forerunner of a malignant condition in certain cases.

**Sodium Chloride and Small Intestine.**—Orr describes experimental studies and clinical observations which indicate that sodium chloride in hypertonic solutions increases the tone of the small intestine and stimulates peristalsis. The intravenous administration of hypertonic solution of sodium chloride as a peristaltic stimulant is indicated in postoperative distention with "gas pains," paralytic ileus, and as an adjunct to the treatment of intestinal obstruction after the obstruction has been relieved either by direct attack or by enterostomy. The administration of sodium chloride solution in proper concentration is considered a specific treatment for the dehydration and hypochloremia incident to the various types of ileus.

**Results of Splenectomy.**—Pemberton presents data from which it is evident that, contrary to the prevalent view of the hazardous nature of splenectomy, the operative results (6.7 per cent) compare favorably with those of other major abdominal operations, and in spite of the relatively common mistakes made in diagnosis, the conditions associated with disorders of the spleen and amenable to splenectomy can readily be identified, provided complete data concerning the blood are correlated with the clinical history. Since the operative results in cases of splenic anemia are largely contingent on the presence of secondary disorders of the liver and portal obstruction, the need for early diagnosis and operation is apparent. Enlarged spleens, in the absence of definite etiology, should be considered as instances of the splenomegaly of potential splenic anemia, and operation should be advised. However, clinical evidence of the presence of hepatic injury should not in itself be considered a contraindication to splenectomy, since many patients in this group live active lives for many years after removal of the spleen. The relative frequency of recurrent hemorrhages in these cases indicates the need for additional effort toward their prevention, such as ligation of the coronary vein and omentopexy. In view of the high percentage of secondary disease of the liver, the small operative hazard, and the extremely favor-

able late results, splenectomy would seem to be the safest procedure in all cases of hemolytic jaundice. Splenectomy for hemorrhagic purpura is a comparatively safe procedure, and the benefits are lasting. In the severe cases, delay of operation is fraught with danger.

**Treatment of Diaphragmatic Hernia.**—Hedblom believes that the ideal treatment of diaphragmatic hernia is reduction of the hernial contents and repair of the ring. Practically, anatomic and clinical variations, age and general condition of the patient determine the indications for operation and largely the operative approach in each individual case. Operative procedures consist of emergency life-saving measures, those preparatory to closure, and operations for reduction and repair. Emergency measures are drainage of an obstructed bowel, or of a localized abscess; preparatory operations are phrenic nerve block or section and partial thoracoplasty. Operation for repair may be through a laparotomy or thoracotomy approach or through a combination of the two. In the majority of cases the hernia may be reduced and repaired by any one of these routes. There are special advantages, limitations and indications for each, depending on the anatomic and clinical type of hernia. Special procedures for closure of large or recurrent hernias include muscle and fascia plastic operations, shifting the attachment of the diaphragm, and thoracoplasty in special cases. Differential pressure anesthesia is essential to obviate the dangers of open pneumothorax during operation, and inflation of the lung before closing the pleural cavity or aspirating the air later to restore the normal vital capacity of the opposite lung, and to reinflate the lung on the side of the hernia. Respiratory insufficiency, especially in infants, intestinal obstruction and postoperative shock are the most common causes of death.

## Indiana State Medical Assn. Journal, Fort Wayne

**24:** 533-588 (Oct.) 1931

Problems of Indiana Medical Profession. A. B. Graham, Indianapolis.—p. 533.
Lateral Pyelogram (Neglected Procedure in Diagnosis of Various Abdominal Conditions). H. O. Mertz, Indianapolis.—p. 537.
Acute Abdomen. D. P. Hall, Louisville, Ky.—p. 541.
Eye Strain. D. W. Weaver, Greensburg.—p. 544.
Cooperation of Dentist and Otolaryngologist. F. J. Spilman, Connersville.—p. 546.
Extra-Uterine Pregnancy: Fifty Cases, Including One Abdominal Pregnancy. L. W. Elston, Fort Wayne.—p. 549.
Intra-Uterine Rupture of Intestine: Case. T. B. Noble, Jr., Indianapolis.—p. 553.

## Journal of Pharmacol. & Exper. Therap., Baltimore

**43:** 245-398 (Oct.) 1931

Influence of Lactic Acid on Hemolysis. J. Sládek, I. A. Parfentjev and B. Sokoloff, St. Louis.—p. 245.
Ergotoxine Miosis. F. F. Yonkman, Boston.—p. 251.
Response of Submaxillary and Parotid Glands of Dog to Histamine. G. Stavraky, Montreal.—p. 265.
*Influence of Sodium Barbital on Reactions of Normal Rabbits to Successive Doses of Insulin. E. L. Jackson.—p. 277.
*Hypoglycemic Action of Hypophysectomized Dog's Blood. R. J. Cowley, Baltimore.—p. 287.
Mechanism of Hypoglycemia Produced by Guanidine and Carbon Tetrachloride Poisoning and Its Relief by Calcium Medication. A. S. Minot, Nashville, Tenn.—p. 295.
*Pharmacologic Effect of Impurities in Ether. W. L. Mendenhall and Ruth Connolly, Boston.—p. 315.
Quantitative Studies on Absorption and Excretion of Hexylresorcinol and Heptylresorcinol Under Different Conditions. B. H. Robbins, Nashville, Tenn.—p. 325.
Method for Quantitative Determination of Hexylresorcinol in Tissues, Blood and Excreta. B. H. Robbins and L. G. Wesson, Nashville, Tenn.—p. 335.
Continued Drinking of Alcohol in Low Concentrations: Some Experimental Results. P. J. Hanzlik, San Francisco.—p. 339.
Studies on Metabolism of Tartrates: I. Colorimetric Method for Determination of Tartaric Acid. F. P. Underhill, F. I. Peterman and A. G. Krause, New Haven, Conn.—p. 351.
Id.: II. Behavior of Tartrate in Organism of Rabbit, Dog, Rat and Guinea-Pig. F. P. Underhill, C. S. Leonard, E. G. Gross and T. C. Jaleski, New Haven, Conn.—p. 359.
Id.: III. Behavior of Tartrates in Human Body. F. P. Underhill, F. I. Peterman, T. C. Jaleski and C. S. Leonard, New Haven, Conn.—p. 381.

**Influence of Barbital on Reaction to Insulin.**—Jackson noted that soluble barbital premedication of rabbits poisoned with insulin increased the convulsant dosage of insulin proportionally to each 25 mg. per kilogram increase in the dose of the barbital. Premedication with 150 mg. per kilogram of soluble barbital suppressed the convulsions of insulin, irrespective of dosage, in 63.5 per cent of the animals. Premedication with 75 mg. per kilogram of soluble barbital has a maximal effect of increasing the fatal dosage of insulin from 14 units per kilogram to 22 units per kilogram. The hypoglycemic action of insulin is retarded maximally by premedication with a dose of 100 mg. per kilogram of soluble barbital. Experimental data are shown which support the view that death in insulin poisoning is not caused by the convulsions alone, even though they may be a factor in the fatal action of the drug.

**Hypophysectomized Dog's Blood.**—Cowley brings out a further example of some relationship between the hypophysis and carbohydrate metabolism. He found that the blood of hypophysectomized dogs showed a marked hypoglycemic action, which was due probably to an increase in a hypoglycemic insulin-like substance or a decrease in a hyperglycemic substance. The increased tolerance to carbohydrates in hypofunction of the hypophysis or in partial or total hypophysectomy, and the hypersensibility to insulin after hypophysectomy, might be explained as due to an increase in the insulin content in the blood following the decreased functioning of the hypophysis or its surgical extirpation.

**Effect of Impurities in Ether.**—According to Mendenhall and Connolly, pure ether is not particularly poisonous to ciliary action in oysters. Small amounts of aldehyde or peroxide in ether result in distinctly toxic effects on ciliary action. Respiration and circulation are not appreciably affected by the amounts of contaminants usually found in anesthetic ethers. Cilia paralyzed by small amounts of impurities in ether may offer an explanation for the development of pneumonia following surgical operations in which contaminated ether is used.

## Medical Journal and Record, New York

**134:** 313-364 (Oct. 7) 1931

Duodenal Tube in Diagnosis. B. B. V. Lyon, Philadelphia.—p. 313.
*Pelvic Abscess in the Male. C. J. Drueck, Chicago.—p. 317.
Employment of Intravenous Strophanthin Therapy in Chronic Heart Insufficiency. F. Grünbaum, Bad Nauheim, Germany.—p. 320.
Modern Conception of Deafness. H. Hays, New York.—p. 325.
Fracture of Os Calcis by Muscle Action. H. Milch, New York.—p. 327.
Fractures of Nose Involving Nasal Bones. H. A. Seigall and M. M. Mancoll, Hartford, Conn.—p. 328.
Sterile Live Maggots in Treatment of Osteomyelitis, Tuberculous Abscesses, Chronically Infected Wounds and Bone Infections. H. I. Goldstein, Camden, N. J.—p. 329.
Circulatory Disturbances in Chronic Arthritis. B. S. Nissé, London, England.—p. 331.
Arthritis: Critical Observations and Modern Diagnostic Amplifications. H. Keller, New York.—p. 335.
Relation of Endocrines to Arthritis Deformans. S. J. Essenson, New York.—p. 341.
Mixed Form of Chronic Arthritis. B. H. Archer, New York.—p. 344.
Practical Therapeutics: Selective Streptococcus Vaccine Therapy in Chronic Arthritis. M. Shuster, New York.—p. 347.
Historical Medicine: Dr. John Radcliffe and the Lues Venerea. W. R. Riddell, Toronto.—p. 350.
An Exodontist's Fee: Four Centuries Ago. R. Williams, Toronto.—p. 351.

**134:** 365-416 (Oct. 21) 1931

What Can Be Determined by Tuberculin Test. F. M. Pottenger, Monrovia, Calif.—p. 365.
Treatment of Early or Acute Syphilis. V. C. Garner and J. H. Stokes, Philadelphia.—p. 369.
Milk Injections in Treatment of Gonorrheal Ophthalmia. F. S. Mainzer, Clearfield.—p. 371.
Case of Paraffin Foreign Body in Bladder: Discussion of Solvents Used to Avoid Operation, Based on Literature. A. Harris, Brooklyn.—p. 372.
Duodenal Tube in Diagnosis. B. B. Vincent Lyon, Philadelphia.—p. 374.
An Analysis of Roentgen-Ray Examinations of One Hundred Chests, with Especial Reference to Chief Complaint, History and Diagnosis. S. I. Muller, Long Island City.—p. 378.
Arthritis: Critical Observations and Modern Diagnostic Amplifications. H. Keller, New York.—p. 381.

**Pelvic Abscess in the Male.**—According to Drueck, the possibility of pelvic abscesses should be borne in mind after all instrumental trauma to the posterior urethra, in severe and prolonged reactions following stricture operations, in punch and cutting operations on the vesical neck, in prostatic cases in which there is a poronged inexplicable elevation of temperature either before or after operation, in diverticulitis of the bladder, and particularly in cases of radium implantation of the prostate and bladder mucosa. The procedure for evacuating pus from the prostate in prostatic abscess may give rise to a superior

pelvirectal abscess as a secondary complication. The nature of the inflammatory lesion in the posterior periprostatic space may vary from a diffuse cellulitis to frank abscess formation. Suppurations here are of frequent occurrence before or after operation, owing to the tendency of the suppurations of the prostate and seminal vesicles to spread posteriorly into the posterior space and thence pierce the fascia of Denonvillier to reach the prerectal space. Retroprostatic and retrovesical suppurations naturally tend to open into the rectum and effect a clinical cure, but in some instances the drainage through the rectum is insufficient and the suppuration extends along and around the rectum to point as an ischiorectal abscess or to spread upward under the peritoneum, forming a retroperitoneal suppuration.

## New England Journal of Medicine, Boston

**205:** 703-746 (Oct. 8) 1931

Fracture Exhibit at One Hundred and Fifteenth Annual Meeting. C. L. Scudder, T. W. Harmer and A. Thorndike, Jr., Boston.—p. 703.
*Treatment of Exstrophy of Bladder by Ureteral Transplantation. H. Cabot, Rochester, Minn.—p. 706.
Medical Progress: Progress in Anesthesia in 1930. P. D. Woodbridge, Boston.—p. 712.

**Treatment of Exstrophy of Bladder.**—In Cabot's experience the principle enunciated by Coffey of ureteral transplantation to the large intestine in exstrophy of the bladder has been more satisfactory than any method previously employed. For patients with exstrophy of the bladder or epispadias in which other operations have failed, the three-stage method of operation gives a low mortality and satisfactory results. The author submits evidence to support the view that this method gives better results than previous methods of transplantation.

## New Jersey Medical Society Journal, Orange

**28:** 731-794 (Oct.) 1931

Historical Sketch of Development of Preventive Medicine in State of New Jersey. J. B. Morrison, Newark.—p. 731.
Practitioner's View of Medical Economics. F. I. Krauss, Chatham.—p. 743.
Moses Maimonides—Physician and Philosopher. S. Schiffmann, Newark.—p. 750.
Constipation. H. S. Read, Atlantic City.—p. 755.
Bacterial Heart Failure. F. C. Weber, Newark.—p. 760.
Relation of Arteriosclerosis to Cardiac Pathology. J. Polevski, Newark.—p. 762.
The Female Sex Hormone. Rita S. Finkler, Newark.—p. 766.
Practical Gastro-Enterology. J. Gerendasy, Elizabeth.—p. 768.
Tonsillectomy by Diathermy. A. S. V. Giglio, Elizabeth.—p. 771.
Prevention and Control of Lead Poisoning in Industry. J. S. Mark, Carteret.—p. 773.

## New Orleans Medical and Surgical Journal

**84:** 227-310 (Oct.) 1931

State Medicine: Annual Oration. J. B. Bullitt, Chapel Hill, N. C.—p. 227.
Radiology as Specialty of Medicine. G. P. Sims, Gulfport, Miss.—p. 234.
Memorial Service. O. W. Bethea, New Orleans.—p. 235.
*Use of "Avertin" as Basal Anesthetic. I. M. Gage and A. Ochsner, New Orleans.—p. 239.
The Mariahuana Menace. A. E. Fossier, New Orleans.—p. 247.
Carcinoma of the Lip: Radium Treatment. M. T. Van Studdiford, New Orleans.—p. 252.
Bacteriology and Pathology of Undulant Fever. L. A. Hebert, Lake Charles, La.—p. 259.
Modern Methods of Treatment of Meningomyelo-Encephalitis (Infantile Paralysis). R. G. Douglas, Shreveport, La.—p. 262.
Sinus Diseases and Their Relation to Eye Disturbances: Medical Treatment of Sinus Diseases Complicated by Eye Disturbances. J. C. Adams, Greenwood, Miss.—p. 269.
Surgical Treatment of Sinus Diseases Complicated by Eye Disturbances. Fern Champenois, Hattiesburg, Miss.—p. 272.
Eye Symptoms and Changes Resulting from Sinus Disease and Treatment of Same. C. C. Buchanan, Hattiesburg, Miss.—p. 275.

**Use of "Avertin" as Basal Anesthetic.**—Gage and Ochsner report fifty-three cases in which they have used "avertin" as a basal anesthetic. Of this number fifteen of the patients had complete anesthesia. Thirty-eight required supplementary anesthesia. Ether was always used as the reenforcing agent. The average blood pressure decrease was 17.5 mm. of mercury. The average time interval for postoperative recovery from the effects of "avertin" was two hours. The type of the operations ranged from laminectomy to removal of an exostosis of the femur.

## Physical Therapeutics, Elmira, N. Y.

**49:** 365-404 (Oct.) 1931

Medical Diathermy. B. B. Grover, Colorado Springs.—p. 365.
*Evolution of Electrosurgery. E. N. Kime, Indianapolis.—p. 367.
*Actinotherapy and the Public. E. L. Libbert, Lawrenceburg, Ind.—p. 380.

**Evolution of Electrosurgery.**—Kime emphasizes the fact that electrosurgery requires not only the ordinary operative skill and surgical judgment but also an intimate knowledge of the underlying physical principles involved. Not only is there absolute necessity for the provision of a suitable apparatus capable of delivering both damped and undamped oscillations in sufficient power and flexibility of control, but likewise these must be utilized in the proper manner at the time and place indicated by the variable factors involved as to anatomy, physiology and pathology. There is much needed work to be done in the standardization of nomenclature and technic as well as much in education of the profession to the importance of meticulous consideration of the why as well as the how in electrosurgical technic. Refinements in technic and anesthesia, as well as in control of operative, electrosurgical and radiologic procedures, are problems of the present and the future. Biopsy control of therapeutics is essential in the treatment of neoplasms and infective granulomas, but the biopsy should be performed by a safe electrosurgical technic and with common sense interpretation, not a small part of which is based on the clinical course of the disease.

**Actinotherapy and the Public.**—Libbert believes that the method of application and the dose of actinic radiation are of equal importance, and the pathologic condition for which it is employed should be as thoroughly understood as in the application of surgery or any other therapeutic agent. It cannot simply be turned on by inexperienced persons with the idea of producing uniformly good results in all conditions indicating its use by following the same technic in every case. The use of actinotherapy by the public is and should be on the increase, since it is an additional method of preventive medicine and as such ranks with certain other ill understood yet definite adjuncts to modern medicine. Both the medical and the lay public should be acquantited with the fact that, while this form of therapy is advantageous to the production and maintenance of good health, it is not without certain dangers, which can be understood only by properly educated and trained medical men.

## Virginia Medical Monthly, Richmond

**58:** 423-494 (Oct.) 1931

*Gastroduodenal Hemorrhage. R. L. Payne and R. D. Jones, Jr., Norfolk.—p. 423.
Subjective Factor in Prognosis of Pulmonary Tuberculosis. B. M. Randolph, Charlottesville.—p. 427.
Discussion of Some Important Factors Concerning the Eighth Nerve. H. R. Slack, Jr., Baltimore.—p. 430.
"Avertin" Anesthesia in Otolaryngology. F. D. Woodward and C. T. Burton, University.—p. 431.
Study of Circulatory System of One Hundred and Fifty Adolescent Girls, Participants in or Candidates for Competitive Athletic Sports. C. B. Conklin, Washington, D. C.—p. 435.
Urinary Bilharziosis. T. V. Williamson, Norfolk.—p. 449.
Embolism of Abdominal Aorta: Case. C. H. Binford, Norfolk.—p. 454.
Addison's Disease in Negro: Case. R. L. King and H. B. Mulholland, University.—p. 455.
Tracheotomy: Observations of Nineteen Cases, Illustrated with Lantern Slides. E. G. Gill, Roanoke.—p. 457.
Fractures. M. H. Todd, Norfolk.—p. 460.
Premature Delivery and Death of Fetus in Several Consecutive Pregnancies in Same Woman: Case. J. M. Howe, Washington, D. C.—p. 463.
Gallbladder Drainage by Duodenal Intubation. V. S. Caviness, Raleigh, N. C.—p. 465.
Inversion of Uterus: Case. J. M. Whitfield, Richmond.—p. 467.
Aneurysm of Aorta. J. F. Elward, Washington, D. C.—p. 468
Vitamin B: Review. R. B. Hillsman, Richmond.—p. 470

**Gastroduodenal Hemorrhage.**—Payne and Jones believe that gastric or duodenal hemorrhage is seldom, except under rare conditions, an indication for immediate operation. There are a great variety of pathologic lesions, both intragastric and extragastric, which may be responsible for gastric or duodenal bleeding. Success in the management of these cases depends entirely on correct diagnosis and proper treatment of the disease responsible for hemorrhage. Roentgenologic examination, while necessary in a small percentage of cases, should be carried out

with extreme care and should never be employed until from three to four weeks after bleeding has ceased. Transfusion is usually contraindicated during or immediately following gross gastric or duodenal hemorrhage except as a preoperative measure in extreme cases in which the surgeon is forced to operate because of repeated hemorrhage. A single gross hemorrhage without symptoms is not an indication for surgical treatment. Repeated gastric or duodenal hemorrhage is in most cases a surgical indication. Hemorrhage associated with the symptoms or roentgenologic signs of gastric or duodenal ulcer should be treated surgically. No single operation is the procedure of choice in the treatment of all bleeding gastric or duodenal ulcers. Benign tumors of the stomach may be the cause of severe secondary anemia. They seldom produce gross hemorrhage. Such lesions should always be removed surgically. When splenic anemia is the cause of gastric hemorrhage, splenectomy offers the greatest chance of relief. Ligation of the splenic artery above the gastric branches may reduce the percentage of poor results following this operation. All possible foci of infection should be eradicated as a preoperative or postoperative precaution in the treatment of gastric or duodenal hemorrhage.

## West Virginia Medical Journal, Charleston

**27:** 433-480 (Oct.) 1931

Immortality. H. M. Hall.—p. 433.
Cultivation and Sterilization of Fly Larva or Maggot. G. C. Weil, J. P. Henry, S. Nettrour and R. Sweadner, Pittsburgh.—p. 458.
Thyroid Deficiency and Chronic Infections. A. G. Hoge, Blue Field.—p. 461.

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## FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Archives of Diseases in Childhood, London

**6:** 259-312 (Oct.) 1931

Electrocardiogram of Normal School Children. C. B. Perry.—p. 259.
Congenital Anomalies of Heart in Elementary School Children. C. B. Perry.—p. 265.
*Value of Alkali in Salicylate Therapy. N. Morris and S. Graham.—p. 273.
*Some Effects of a Ketogenic Diet. R. W. B. Ellis.—p. 285.
Alkalosis in Vomiting of Infancy. M. Maizels.—p. 293.
Race, Rheumatism and Growing Pains. J. C. Hawksley.—p. 303.
Three Cases of Duodenal Obstruction in the New-Born. C. P. LaPage, Annie E. Somerford and Fanny Howe.—p. 307.

**Value of Alkali in Salicylate Therapy.**—Morris and Graham say that signs and symptoms of intolerance to salicylates are not infrequently observed, especially when the larger doses are given unaccompanied by alkali, and hence the use of alkali in equal or greater amounts than that of the salicylate employed has achieved a certain amount of popularity in the prevention of the toxic manifestations. The value of the combination of salicylate and alkali would seem to have been definitely proved by routine clinical work. Nevertheless certain observers still deny the necessity of the use of alkali. A logical method of testing the value of the added sodium bicarbonate seemed to be to give certain patients salicylate alone and observe the ill effects, if any, produced; then to add bicarbonate and note any diminution or alleviation of the toxic manifestations. It was soon found that 60 grains (4 Gm.) daily was the maximum amount which, without the addition of alkali, could be tolerated by the average child without toxic signs appearing. Fifty grains (3.25 Gm.) daily in no case produced any ill effects, but 60 grains (4 Gm.) not infrequently produced slight vomiting which was not always attributable to constipation. If the daily amount was increased to 90 grains (6 Gm.), signs of intolerance were invariably produced in from three to five days, and in some cases these were of a severe and alarming nature. Vomiting was a constant and early sign and usually preceded all other manifestations of salicylism. Drowsiness and confused mental states or mental torpor occurred in some. Many became apathetic and disinterested; the speech in one instance was thick and slurring. Air hunger of greater or less severity, but not necessarily in proportion to the other signs, occurred in all cases and sometimes to a marked degree; this was the typical acyanotic dyspnea which is known to be associated with an acidosis of the acid-poisoning type. Acetonuria was present in the majority of the cases but was never extreme and in a few cases was entirely absent. Tinnitus, strangely enough, was not troublesome and was not complained of by any of the patients. This manifestation, however, has occasionally proved troublesome in some patients receiving both sodium salicylate and sodium bicarbonate in the routine way. All the signs and symptoms mentioned disappeared rapidly on the discontinuing of the salicylate or on the addition of twice the amount of bicarbonate. It is an interesting and practical observation that in those patients to whom salicylate and bicarbonate had been previously given the signs of poisoning on omission of the alkali either did not develop or, if they did, were not as severe as in those to whom alkali had not previously been given. Of nine patients to whom sodium salicylate and sodium bicarbonate had previously been given, four did not show toxic symptoms, in five vomiting occurred, and in only one were there headache and depression. The last child, it is interesting to note, had had the alkali combined with the salicylate for a period of only seven days. It seems indisputable, then, that whatever else the alkali may do it is of extraordinary value in preventing development of the signs and symptoms of salicylate poisoning. This is so striking that the authors believe it unjustifiable to prescribe large doses of salicylate without giving in addition sodium bicarbonate.

**Effects of Ketogenic Diet.**—In two groups of children subjected to tonsillectomy, Ellis found that considerable postanesthetic ketosis could exist without necessarily causing vomiting or other symptoms. Artificially produced ketosis before and after operation was well tolerated. In two cases of cyclic vomiting and in two patients who had had convulsions at the onset of an acute infection, a ketogenic diet did not produce any symptoms. The intolerance to carbohydrate produced by a high ketogenic diet was investigated by means of the dextrose tolerance test. While insulin tended to readjust the blood sugar curve to normal, sodium bicarbonate did not have any effect in lessening the intolerance. The majority of patients showed a loss of weight or failure to gain weight during the ketogenic period. It is not claimed that ketosis can never be responsible for clinical disturbances, since in extreme degrees considerable change in acid-base equilibrium may take place. It is, however, suggested that a considerable ketosis may be well tolerated by many children, including certain "cyclic vomiters" and normal children undergoing operation. It follows that a diagnosis of "ketosis" as an explanation of symptoms should be made only with the greatest caution and when every other possible cause has been excluded. This is of additional importance when it is remembered that prolonged administration of dextrose in considerable quantity may result in precipitation of diabetes in a subject in whom pancreatic function is defective.

## British Journal of Dermatology & Syphilis, London

**43:** 477-552 (Oct.) 1931

*Roentgen Treatment of Ringworm of Scalp: Survey of 2,400 Cases. S. C. Shanks.—p. 477.
Erythème Papulo-Circine Migrateur of Darier: Case. A. D. McLachlan and W. H. Brown.—p. 506.

**Roentgen Treatment of Ringworm of Scalp.**—Shanks gives an account of the technic used and results obtained in a series of 2,400 cases of ringworm of the scalp in which the patients were treated by him during the past ten years. He emphasizes particularly the importance of dosage. The problem presenting itself is that of raising the dose over the threshold level necessary to cause defluvium, and yet keeping it below the upper danger limit beyond which imperfect regrowth results. Unfortunately, that safety band which one must reach, and still more must not overstep, is narrow. The author has not been able to convince himself that variation in sensitivity on the part of the patient occurs to any marked degree. Variation does probably occur within narrow limits. It has been repeatedly observed during the series that of four patients treated in a morning's work, the first and fourth ones, say, depilated normally, while the second and third showed an incomplete defluvium, in spite of all the physical factors apparently being constant. Individual reaction may in part account for this, if one assumes that the dose given to all was near the threshold. In the main, however, variation in end-results means variation in dosage, and unfortunately a really satisfactory method of dosage estimation is not yet available.

## British Medical Journal, London

2: 687-732 (Oct. 17) 1931

*Observations on Resuscitation from Asphyxia and Prevention and Treatment of Secondary Pneumonia by Inhalation of $CO_2$. Y. Henderson.—p. 687.
Diabetes Insipidus Following Fractured Skull. A. Patrick.—p. 689.
Congenital Pyloric Stenosis. C. M. Page.—p. 691.
Premedication. S. Rowbotham.—p. 693.
Congenital Talipes Equinovarus. D. Browne.—p. 696.
Bacterial Endocarditis in Infant 13 Days Old. J. D'Ewart.—p. 699.
Rapid Laboratory Test for Pregnancy. Gladys H. Dodds.—p. 700.

**Resuscitation from Asphyxia and Prevention of Secondary Pneumonia by Inhalation of Carbon Dioxide.**—Henderson calls attention to the fact that in cases of drowning, asphyxiation and other accidents, and after surgical anesthesia, the prevention of secondary pneumonias is almost as important as the immediate resuscitation. Inhalation of carbon dioxide mixed with oxygen or with air is the most effective means of stimulating respiration. This inhalation has proved to be also a highly effective preventive, indeed, it is essentially the specific preventive, of the collapse of the lungs that leads to pneumonia. These two advantages have now been demonstrated by experience in large numbers of cases of carbon monoxide asphyxia, drowning and other accidents. In the asphyxia of the newborn this inhalation is replacing the old brutal and often ineffective methods of swinging, spanking and dipping. In surgical clinics this treatment is used to counteract failure of breathing under anesthesia, to restore a normal circulation, and especially to prevent postoperative pneumonia. Respiration is closely associated with the tonus of the muscles, especially of the thorax. Depressed breathing and low tonus permit collapse of parts or the whole of a lung. From this collapse, if infection is present, pneumonia develops. If respiration and muscle tonus are stimulated by inhalation of carbon dioxide, the lungs are kept open and the development of pneumonia is prevented.

## Lancet, London

2: 779-832 (Oct. 10) 1931

Innervation of Blood Vessels of the Limbs. J. S. B. Stopford.—p. 779.
*Blue Sclerotics and Associated Defects: Study of Four Families with Notes on Their Mineral Metabolism. G. H. Stevenson and D. P. Cuthbertson.—p. 782.
Physical Treatment of Prostatic Lesions. E. C. Titus and V. C. Pedersen.—p. 788.
*Injection of Highly Purified Liver Preparations in Pernicious Anemia. J. F. Wilkinson.—p. 791.

**Blue Sclerotics and Associated Defects.**—Stevenson and Cuthbertson give pedigree tables of four families one or more of whose members have suffered from one or more of the associated defects of bone fragility, blue sclerotics, otosclerosis, and liability to dislocations and sprains. Metabolic studies revealed definitely diminished retentions of calcium, phosphorus and magnesium in two children affected with the associated defects of bone fragility, blue sclerotics and hypotonicity of ligaments. There did not appear to be any marked deviation of these minerals from the normal excretory paths in these children and in two adults studied. The concentration of calcium and phosphorus in the blood was normal. Viosterol and cod liver oil did not appear to have any specific effect in these abnormalities.

**Liver Treatment of Pernicious Anemia.**—Wilkinson describes a method of treatment for the severest cases and also refractory cases of pernicious anemia. This involves the use of a highly purified and extremely potent preparation from liver extract; it is practically free from protein and does not affect the blood pressure when injected intravenously or intramuscularly. Both routes are efficient, rapid and painless, but the intravenous method is slightly quicker in its results. The method is intended to supplement the ordinary oral therapy during the critical stages of the disease, but it can be used as the sole treatment, intramuscular injections being readily given at regular intervals according to the needs of the patient.

## South Africa M. Assn. Journal, Cape Town

5: 585-616 (Sept. 26) 1931

Plea for State Medicine. F. H. Napier.—p. 587.
Pathology and Treatment of Colles' Fracture. M. C. Rous.—p. 593.
Scurvy in Native Children. Shena Ross.—p. 596.

## Journal de Radiologie et d'Electrologie, Paris

15: 473-536 (Sept.) 1931

Roentgenography of Urethra and Prostate. R. Ledoux-Lebard, J. Garcia-Calderon and J. Petetin.—p. 473.
Conductivity of Skin of Frog Under Passage of Alternating Current. A. Strohl and J. Dubost.—p. 491.
*Functional Neuroglandular Roentgen Therapy: Suprarenal Region. R. Desplats.—p. 502.
Polyroentgen Therapy in Localized Decalcifications. G. Chaumet.—p. 510.
Cerebral Pneumoventriculography. J. Jouret.—p. 516.

**Functional Neuroglandular Roentgen Therapy: Suprarenal Region.**—Desplats asserts that irradiation of the suprarenals has many applications in functional neuroglandular therapy. He reports his results in the treatment of syndromes in arterial obliteration of the limbs, painful arterial syndromes as in trophic disturbances and the gangrenes that accompany them, certain vasomotor disturbances, forms of functional diabetes, instances of painful bone absorption, physiopathies accompanying certain traumatisms, and chronic rheumatism. Suprarenal roentgen therapy is efficacious in pathologic states formerly considered purely neuropathic but, according to the author, now considered as states due to disequilibrium in the neuro-endocrine system.

## Presse Médicale, Paris

39: 1461-1476 (Oct. 7) 1931

*Indications for Pneumonotomy and Pneumectomy in Pulmonary Abscess. E. Sergent, A. Baumgartner and R. Kourilsky.—p. 1461.
Granular Tuberculosis of Skin Originating in Blood and Tuberculids. P. Ravaut, J. Valtis and Guerra.—p. 1464.
Chrysotherapy in Tuberculosis. L. Bernard, C. Mayer and Sakellaropoulos.—p. 1469.
Nephropyelography: Intravenous Injection of Skiodan. H. Wohlers and S. Kadrnka.—p. 1473.

**Indications for Pneumonotomy and Pneumectomy.**—Sergent and his co-workers outlined in 1929 the principles underlying the treatment of suppurations of the lungs. Treatment should depend on the seat of the infection, whether superficial or deep, and the anatomopathologic and bacteriologic character determining the acute or chronic evolution of the abscess. The interventions suggested were simple pneumonotomy which is equivalent to transthoracic drainage of the abscess, and partial pneumectomy, which is really the exeresis or destruction of the source of suppuration. Two representative cases are described in detail and the following suggestions are made: If the abscess is quite recent and the ambient bronchopneumonic processes have not taken on an infective, necrotic evolution, transthoracic drainage or simple pneumonotomy is sufficient. When there is a tendency toward a chronic state, spontaneous drainage through vomicae or bronchoscopic aspiration is insufficient, while pneumonotomy assures drainage and permits curettage of the cavity, drainage and formation of cicatrices. If the abscess is already old, if the ambient bronchopneumonic processes have assumed an infective, putrid, necrotic evolution, pneumonotomy will not do; it may be followed by deceptive abatement, of more or less short duration, but not by cure. Destruction of the tissue has begun and only partial pneumectomy and exeresis of the seat of infection can be effective. Too much caution in the latter case is not advantageous. The authors recall that putrid abscesses may have bacteriologic differences, some developing rapidly, while others may seem stationary, spreading little in spite of great age. Greater cooperation between the clinician and the surgeon is recommended.

39: 1493-1516 (Oct. 14) 1931

*Direct Culture in Tuberculous Effusions of Pleura. F. Bezançon and E. Buc.—p. 1493.
Digestive Bead Test in Medical Practice. M. Einhorn.—p. 1494.
Studies on Testicular Grafts. H. Velu.—p. 1496.

**Direct Culture in Tuberculous Effusions of Pleura.**—Bezançon and Buc enumerate the difficulties in the microscopic examination of tuberculous smears, especially in the acute period when the clear serofibrinous or serous exudate of pleurisy or artificial pneumothorax shows but few bacilli. Guinea-pig inoculation was thought more preferable but there also the results were variable and often belated. The authors review the literature dealing with the direct culture of tuberculous exudates and describe their own experiences. They adopted

the following mediums: peptone, 2 Gm.; glycerin, 5 Gm.; water, 100 cc., neutralizing with 1 Gm. of monobasic potassium or sodium phosphate. The medium was tubed (2 to 3 cc. per tube) and sterilized at from 110 to 115 C. Pleural fluid was inoculated in quantity almost equal to the tubed medium and the two liquids were mixed. Growth in the liquid usually appeared the third or fourth week in the form of cotton filaments, sometimes at the bottom of the tube as small opaque white granules; these increased in volume and assumed an arborescent aspect. The growth was more vigorous close to the surface of the liquid, there assuming cottony colonies. The bacilli were acid-resistant, often highly granular, sometimes fragmentary, and virulent for the guinea-pig. Direct culture of the serous or serofibrinous pleural exudates from an artificial pneumothorax gave the authors almost constant results; six cases of ordinary pleurisy (usually poorer in bacilli) resulted in growth in five cases. In old thick, puriform, pleural effusions the microscopic examination was sufficient and animal inoculation was usually effective. For direct culture it was found necessary to add to the peptone-glycerin medium 3 per cent gelose and one-third volume of blood serum. In making cultures of old puriform exudates, as in serous exudates, inoculations were made exclusively from effusions in the course of artificial pneumothorax.

## Revue Française de Gynécologie et d'Obst., Paris

**26:** 417-463 (Aug.) 1931

*Neglected Shoulder Presentations. M. Reeb.—p. 417.
Operation for Advanced and Complicated Cancer of Uterus. H. Roth.—p. 426.
Fillos' Caustic in Ambulatory Treatment of Cervical Metritis. L. Pouliot.—p. 441.
A Speculum Virginis with Unequal Blades. L. Pouliot.—p. 446.

**Neglected Shoulder Presentations.**—During the period 1928-1931, Reeb encountered seventeen transverse or shoulder presentations among 3,345 deliveries (one shoulder presentation to 196 deliveries). Shoulder presentations before term and those observed during twin pregnancies were not counted. Most of the patients coming to the clinics were from the country and had never received prenatal care. In eight cases, under general anesthesia, podalic version was performed easily without mortality and with slight or no morbidity for the patient; seven infants were delivered living, one infant died during delivery, and another, in consequence of a meningeal hemorrhage, died three days after delivery. In one case the shoulder presentation, complicated by a flattened rachitic pelvis and a very rigid uterus, was treated by low cesarean section under rachianesthesia with good result to both the mother and the child. The author discusses his clinical observations in eight cases and concludes as follows: If the child is dead, the neck accessible under general anesthesia, and the lower uterine segment not too much distended, decapitation is the operation of choice. If, however, the conditions seem favorable, version is not to be absolutely disregarded. Following intervention by the vaginal route, a careful examination of the cord and the uterine cavity is absolutely necessary. If embryotomy seems difficult and dangerous because of the distention of the uterine segment, it is better to choose the upper cesarean section. If there is present a vaginosegmental rupture or if the patient is manifestly infected, one must have recourse to the upper route and do a total extirpation (closed sac), according to Mikulicz, and perform vaginal drainage. If the infant is alive and version is contraindicated or impossible, the author does not advise an embryotomy but a low cesarean section. However, it is most difficult to decide whether one should perform a conservative low cesarean section with or without drainage, a mutilating cesarean section, or the cesarean section of Porro.

## Policlinico, Rome

**38:** 1305-1344 (Sept. 7) 1931. Practical Section

*Action of Insulin on Renal Thresholds of Patients with Diabetes Mellitus. G. Sorge.—p. 1305.
Detachment of Spina Iliaca Anterior Superior Caused by Trauma While Playing Football. A. Turco.—p. 1308.

**Action of Insulin on Renal Thresholds.**—Sorge has found that in diabetic and in nondiabetic persons there is observable, as a result of administration of insulin: (1) increase of glycemia in diabetic persons with reduction of glycosuria; (2) increase of chloremia with reduction of chloruria, and (3) increase of hydremia with reduction of diuresis. According to the author, these changes are the expression of the elevating action of insulin on the renal thresholds of secretion of sugar, chlorine and water. The fundamental inquiry, in the author's opinion, is to discover whether it is a question of a local direct renal action, as has been demonstrated in the case of phlorhizin, or whether (which is perhaps more likely) it is the result of an indirect action on the extrarenal apparatus that governs or influences the secretory phenomena.

**38:** 457-524 (Sept. 15) 1931. Surgical Section

Lymphangioma of Mesentery: Case. T. Calzolari.—p. 457.
*Diagnosis of Renal Tumors by Means of Pyelography. N. Cirillo.—p. 465.
Pathologic Changes of Germinative Tissue of Bone. G. Ferro Luzzi.—p. 474.
*Sympathicolumbar Gangliectomy. G. Gucci.—p. 482.
Agenesia of Kidney with Diffuse Papillomatosis of Pelvis. P. Mariconda.—p. 491.
Cysts of Mesosigmoid: Importance and Advantages of Roentgen Study. G. Petta.—p. 494.
Hematuria Due to Tonsillitis. N. Spinelli.—p. 506.
Sarcomatoid Carcinoma of Breast. L. Sussi.—p. 514.

**Diagnosis of Renal Tumors by Means of Pyelography.**—Cirillo, after studying some cases of tumor of the kidney diagnosed by means of ascending and descending pyelography and controlled surgically, reaches various conclusions. On the basis of two cases in which the pyelographic and roentgenoscopic observations led to an erroneous diagnosis, he explains certain criteria of general symptomatology and warns against various common causes of error in the interpretation of pyelograms for the diagnosis of kidney tumors.

**Sympathicolumbar Gangliectomy.**—Gucci performed on dogs the resection of the second, third and fourth right sympathicolumbar ganglions and studied the effects on the lower limb of the side operated on. As a constant result he found an increase of pressure in the limb of the side operated on, which increase persisted for about a week.

## Riforma Medica, Naples

**47:** 1358-1390 (Sept. 7) 1931

Indications for Seaside Treatment in Pediatric Practice. G. Frontali.—p. 1359.
Hyperlacticemia Resulting from Epinephrine. M. Calabrese.—p. 1365.
*Surgical Treatment of Angina Pectoris. G. Pieri.—p. 1369.

**Surgical Treatment of Angina Pectoris.**—Pieri reported in 1925 the first case of angina pectoris in which, under the inspiration of Danielopolu, he performed a simple neurotomy on the cervical sympathetic without removing ganglions. In 1929 he reported a second case, in which the technic was further developed. He now reports a third case in which he operated in 1930. He gives also the later outcome in the two previous cases, and then discusses the present status of the problem. His present case has a special interest as it is the one in which the results secured have been the most satisfactory. The attacks ceased, and the patient (a woman, aged 69), who before the operation was unable to take even a few steps without feeling a sensation of extreme anxiety, can now walk several kilometers without any disturbance other than slight shortness of breath due to the imperfect condition of her circulation. This result has been maintained for fifteen months since the operation. The technic employed is illustrated by a diagram. All the rami communicantes that were directed outward from the stellate ganglion and from the middle ganglion were divided; also the cord of the sympathetic nerve at the lower pole of the superior ganglion; likewise a band of nerve fibers that is directed downward from the lower portion of the superior ganglion, and a nerve thread that was detached from the vagus nerve and extended to the top of the hyoid bone and descended into the thorax. The branches that are detached from the lateral margin of the stellate and the middle ganglions contain the cardio-aortic sensory fibers that extend into the roots of the brachial and cervical plexuses and hence to the medullary centers (fibers the stimulation of which during the attack produces the radiated pains in the left arm). The division of the cord of the sympathetic nerve below the lower pole of the first cervical ganglion is intended to interrupt the afferent fibers that, joined to the stellate ganglion, project in the cord and are directed toward the upper part of the neck (through the cervical

plexus) and to the head, through the carotid nerve. In this third case, the author omitted the decortication of the carotid bulb performed in the second case, as it gave the patient little additional relief. All the refinements that the author has introduced were for the purpose of intercepting the sensory fibers that conduct the violent pain sensations of an attack of angina pectoris from the cardio-aortic system to the centers of consciousness.

## Deutsche Zeitschrift für Nervenheilkunde, Berlin

**122:** 117-208 (Sept. 4) 1931

*Funicular Myelosis in Hemolytic Icterus. H. Curschmann.—p. 119.
Occurrence of Iso-Agglutinins in Cerebrospinal Fluid. A. Kral.—p. 126.
Various Reactions During Irritation of Sole of Foot. H. J. Katzenstein.—p. 137.
Syndrome of Friedreich's Ataxia Following Epidemic Encephalitis. F. Salus.—p. 179.
Encephalomyelitis Disseminata. A. Mandl and F. Puntigam.—p. 183.
Progressive Muscular Atrophy (Chronic Polyneuritis?) in Gout. W. Mackh.—p. 202.

**Funicular Myelosis in Hemolytic Icterus.**—Curschmann reports a typical case of acquired hemolytic icterus in which a spinal syndrome developed, which in all its phases resembled the funicular myelosis that frequently occurs in pernicious anemia. There were tabetiform symptoms with ataxia, positive Romberg sign, extended paresthesia, hyperesthetic zones, hypesthesia and areflexia. Syphilitic symptoms were entirely absent in the blood as well as in the spinal fluid, and the intactness of the pupils and of the cerebral nerves also corresponded to the funicular myelosis of pernicious anemia. The spinal syndrome developed gradually and several years after the onset of the icterus. The author considers this case interesting because in other reports on hemolytic icterus spinal complications are not mentioned. More especially, this seems to be the only case of acquired hemolytic icterus, although previously the author had observed cases of familial hemolytic icterus with severe spinal paralysis. He reaches the conclusion that in the familial cases of hemolytic icterus as well as in the acquired case the spinal disturbances were a partial manifestation of the hemolytic icterus, just like funicular myelosis in pernicious anemia, and he advises that in both forms of hemolytic icterus the patients should be examined for spinal symptoms.

## Jahrbuch für Kinderheilkunde, Berlin

**133:** 1-128 (Sept.) 1931

Treatment of Hemorrhagic Diseases. K. Klinke.—p. 1.
*Congenital, So-Called Cerebral Form of Adiposogenital Dystrophy. H. Willi.—p. 12.
Significance of Orthodiagraphy for Estimation of Size of Heart During Childhood: Constitution of Children with Circulatory Diseases. A. F. Hecht.—p. 26.
*Chemistry and Immunobiology of Scarlet Fever Blanching Phenomenon. J. Berendes.—p. 74.
Rôle of Hemato-Encephalitic Barrier in Genesis of Neurotoxic Syndrome During Acute Nutritional Disturbances. S. J. Schaferstein.—p. 94.
Rudimentary Neuropsychic Functions in Nurslings. J. S. Galant.—p. 104.
Harmlessness and Efficacy of Calmette Vaccination. Helene Eliasberg.—p. 109.

**Adiposogenital Dystrophy.**—Willi observed adiposogenital dystrophy, syndactylism and severe visual disturbances in two children whose parents were first cousins. A review of the literature convinced him that one third of the patients with this syndrome descend from consanguine parents. In the ascendencies of other patients there occurred nervous disturbances, alcoholism, adiposity and polydactylism. Adiposity is the symptom that is most noticeable in these patients, but whether it is the most important one cannot be decided. Although the adiposity is generalized, it is especially noticeable on the abdomen, mammae, hips, thighs and the upper portion of the arms. These sites of predilection indicate the hypophyseal type. The genital hypoplasia is not always present, but malformations of the hands or feet and visual disturbances are found regularly, and occasionally there are also cranial deformities. The intelligence is usually somewhat below the average, but sometimes it is fairly good. Usually there is a lack of interest and the patients are slow and calm. The metabolism is often considerably reduced. The pathogenesis of the syndrome is still unknown, but since the three symptoms of adiposity, syndactylism and visual disturbances concur, it may be assumed that the hereditary factors are coupled; that is, that they occur in the same chromosome.

**Blanching Phenomenon in Scarlet Fever.**—In analyzing the blanching phenomenon in scarlet fever, Berendes first studied the calcium blanching phenomenon and found it positive in 10 per cent of the cases. In order to detect the blanching principle in convalescent serum, the serum was subjected to various physical and chemical modifications. When it was diluted to as much as 1 to 80, it still had a blanching effect; however, if it was diluted more than that, it did not. Serum that was brought to a temperature of from 50 to 56 C. caused blanching, but if heated to 70 C. it did not. The effective component could not be removed from the serum by various inorganic and organic adsorption mediums, such as animal charcoal, silicic acid, kaolin and talc. Attempts were made to fractionate the serum protein by various alcohol precipitations, but the results were not convincing. Precipitation of the serum protein by means of acid and subsequent rediluting in alkali destroyed the blanching power. Fractionation experiments with ammonium sulphate revealed that the protein fractions, with the exception of albumin, had a blanching effect. Ultraviolet irradiation lasting from forty to sixty minutes did not destroy the blanching component. Moreover, the blanching power may even be retained after the convalescent serum has been exposed to the intense influence of pepsin ferment. Placental serum was found to have the same blanching effect as convalescent serum.

## Wiener Klinische Wochenschrift, Vienna

**44:** 1125-1152 (Sept. 4) 1931

Surgical Treatment of Acute Profuse Gastric and Duodenal Hemorrhages. H. Finsterer.—p. 1125.
Use of "Avertin" and Prevention of Its Dangers. E. Domanig.—p. 1129.
*Neuroses and Psychoses in Menstrual Disturbances. B. Aschner.—p. 1132.
Distribution of Thorium in Organism Following Injection of Colloidal Solution of Thorium Dioxide. T. Leipert.—p. 1135.
Hitherto Unknown Disease Entity in Course of Catarrhal Inflammations of Respiratory Tract. R. E. Perl.—p. 1136.
Primary Carcinoma of Skin. H. Fuhs.—p. 1139.
Psychiatric and Neurologic Complications of Last Influenza Epidemic. O. Kauders.—p. 1144.
Necessary Considerations in Tooth Extraction. H. Wolf.—p. 1145.

**Neuroses and Psychoses in Menstrual Disturbances.**—Aschner points out that menstruation is an important excretory process, and that irregularities in this function may lead to serious disturbances. Even in women in whom menstruation is normal, the onset of the menses is often preceded by depression and abnormal irritability. In dysmenorrhea, the disturbances are sometimes so severe that they present the aspects of a serious intoxication with nausea, migraine, diarrhea, cutaneous eruptions, fever, chills and herpes. Nervous disturbances are especially marked in cases of hypomenorrhea (too rare and too scanty menstruation). The author discusses and illustrates with case reports the concurrence of hypomenorrhea with such conditions as nervous irritability, vasomotor neuroses, insomnia, sleepiness, anxiety, hysterical conditions, mania, hypomania, periodic mania, paranoia, depression and melancholia. In many such cases, in which all other therapeutic measures had failed, he obtained favorable results by increasing the menstruation by means of emmenagogues. Laxatives, sweating cures and venesection were likewise found helpful in many cases.

## Zentralblatt für Chirurgie, Leipzig

**58:** 2433-2496 (Sept. 26) 1931

*Ascaris Lumbricoides Perforating Through Intestinal and Abdominal Walls After Resection of Stomach. E. Schmutzler.—p. 2435.
Traumatic Origin of Thrombophlebitis. H. Dewes.—p. 2436.
Malignant Gastric Polyposis. A. Pop and Onaca N.—p. 2440.
*Intravenous Injection of Morphine as Diagnostic Aid for Localization of Abdominal Disorder. A. Hildebrandt.—p. 2442.
Technic of Microscopic Examination of Vermiform Appendix. I. I. Genkin.—p. 2443.
Simple Forceps for Tying Wires in Synthesis of Fractured Bones. A. Hildebrandt.—p. 2445.

**Ascaris Lumbricoides Perforating Through Abdominal Wall After Resection of Stomach.**—Schmutzler reports the case of a woman, aged 55. The anamnesis and the clinical examination indicated a gastric ulcer, and roentgenoscopy corroborated this in revealing an ulcer with niche formation on

the lesser curvature. The surgical treatment was successful, but three days after the operation a fistula formed in the wound, which discharged seropurulent material. The patient complained of an itching sensation in the fistula and felt as if a foreign body was present. The fistula remained open and the discharge increased, but fever was absent. Twelve days after the operation a piece of necrotic tissue was to have been removed from the fistula, but instead a parasite, Ascaris lumbricoides, was removed. After that the fistula showed a tendency to heal. The author mentions several similar cases that are reported in the literature. In some of these a fatal peritonitis developed. The absence of peritonitis symptoms in the reported case is accounted for in that the parasite probably slipped through the anastomosis suture of the stomach and intestine shortly after the operation, before there was strong adhesion.

**Intravenous Injection of Morphine as Diagnostic Aid for Localization of Abdominal Disorder.**—Hildebrandt states that for several years he has employed morphine injections not only for quick relief of severe colic but also for localization of the disease focus. If the entire abdomen is painful and there is no site that is especially sensitive to pressure, he gives an intravenous injection of morphine and as a result the painfulness disappears. Now the abdomen is palpated, particularly in the region of those organs from which a peritonitis may originate. In nearly all instances a site is detected which is especially sensitive to pressure and here is the focus of the disease. As example the author cites one case in which perforation of a gastric ulcer was detected in this manner. The operation revealed the correctness of the diagnosis.

## Zentralblatt für Gynäkologie, Leipzig

**55:** 2657-2720 (Sept. 5) 1931

*Nature and Etiology of Cystic Hyperplastic Changes of Female Generative Organs, Including So-Called Endometrioses. H. v. Behring. —p. 2657.
Influence of Hormones of Anterior Lobe of Hypophysis on Male Genital Organs, Particularly the Testes. H. O. Neumann and F. Peter. —p. 2670.
*Results of Transplantation of Ovaries in Human Beings with Simultaneous Administration of Hormone Preparations. F. Siegert.—p. 2684.
Paraganglion Cells and Neuromas in Hilus of Ovary of Human Beings and Monkeys. R. Joachimovits.—p. 2697.
Technic of Roentgenologic Examination of Nurslings. F. W. Wahl. —p. 2704.
*Observations on Influence of Thymus Extracts on Uterus. G. Daneff. —p. 2706.
Structure of Uterine Cervix in Nonpregnant Women and Changes During Pregnancy with Especial Consideration of Lower Uterine Segment. B. S. Tarlo.—p. 2712.

**Etiology of Cystic Hyperplastic Changes of Female Generative Organs.**—In the term paramenstruation, von Behring combines female disturbances that present varying aspects but which are closely related to each other in that they are all caused by hormonal disturbances in the ovaries. He discusses chronic cystic hemorrhagic metropathia, juvenile hemorrhagic metropathia, chronic cystic mastopathia and the so-called endometrioses. Under paramenstruation he understands pathologic conditions that develop in the organs that are influenced by the ovaries at a time during which the ovaries are not yet or not any longer capable of proper hormonal functioning; namely, during the menarche and during the menopause. Occasionally such disturbances may also develop during the intermediate period, as for instance following a pregnancy. Because the developmental and action mechanisms of the sex hormones are as yet not fully understood, it is still difficult to differentiate clearly between a qualitative dyshormonal disturbance and a quantitative polyhormonal disorder. However, on the basis of the histologic pictures that the author observed in the cystic hyperplastic proliferations in the female genitalia he concludes that they are caused by qualitative changes in the hormonal stimulation.

**Transplantation of Ovaries in Human Beings with Simultaneous Administration of Hormone Preparations.**—Siegert's report is based on observations in thirty-seven cases in which transplantation of ovaries was done following extirpation of both ovaries, and in five cases in which it was done on account of dysfunction of the ovaries. To the first group belonged women between the ages of 19 and 24 who had to undergo oophorectomy on account of progressing and relapsing inflammation of the adnexa, or because of bilateral ovarian cystoma. In order to avoid the severe deficiency symptoms, which could be expected following oophorectomy at such an early age, the still healthy portions of ovarian tissues were transplanted either subfascially, that is, between the rectus muscle and its sheath, or into the uterus or into both. This procedure proved successful in 51 per cent of the cases. The author further reports his observations on five women with ovarian dysfunction in whom ovarian tissues from other women were implanted into the rectus sheath. In three of the women the dysfunction was primary. In two of these the treatment was successful, and in the third patient, in whom complete amenorrhea existed, the deficiency symptoms decreased but menstruation did not set in. In the two women with secondary dysfunction of the ovaries the effects of the implantation were less favorable. In the last part of the article the author describes the effects of administration of ovarian hormone preparations on thirteen patients who had undergone ovarian transplantation following oophorectomy. He found that hormone therapy of sufficient duration and intensity aids and strengthens the efficacy of ovarian transplantation.

**Influence of Thymus Extracts on Uterus.**—Daneff found that extract obtained from the thymus of premature infants or from the new-born, and subcutaneously injected into mammals during the second half of pregnancy, induced delivery. In nonpregnant animals this extract caused hyperemia and swelling of the genitalia and hypertrophy of the uterus. On the resected uterus of nonpregnant guinea-pigs the extract exerted no influence, but in situ the nonpregnant uterus contracted following intramuscular injection of the thymus extract. On the other hand, thymus extract that was obtained from young embryos did not have any influence on the uterus and the same was observed in experiments with extracts from other endocrine glands, except for suprarenal extract, which seems to intensify the action of the thymus extract but otherwise is ineffective. On the basis of these observations, the author concludes that the secretion of the fetal thymus is an essential factor in bringing about the delivery of the fetus.

## Vrachebnaya Gazeta, Leningrad

Sept. 15, 1931, numbers 16-17, pp. 1203-1314

Standardized Methods in Gastro-Intestinal Diseases. R. A. Luriya. —p. 1211.
Problems in Treatment of Malignant Tumors. S. A. Kholdin.—p. 1218.
*Preparation of High Titer Antitetanus Serum. A. V. Ponomarev and G. A. Pavlov.—p. 1225.
Clinical Aspect of Epidemic Cerebrospinal Meningitis Among Children in Kharkov. N. M. Frishman.—p. 1232.
Pathologic Changes of Spinal Fluid in Paralytic Diseases. S. I. Gendelevich.—p. 1237.
Acute Appendicitis and Laxatives. I. D. Anikin and N. N. Samarin. —p. 1244.
*Conservation of Complement for Wassermann Reaction. S. L. Shirvindt and R. Y. Liberman.—p. 1256.
Various Phonetic Sounds in Auscultation of Heart. G. I. Katz. —p. 1259.
Phlegmons of Gastro-Intestinal Tract. O. E. Kobetz-Almazova. —p. 1263.

**Preparation of High Titer Antitetanus Serum.**—Ponomarev and Pavlov used tetanus anatoxin in their immunization of horses for antitoxic serum. The anatoxin was prepared by (1) preparation of a highly potent toxin using one to three year old cultures; (2) adding to this toxin 3 per cent of a 39 per cent solution of formaldehyde; and (3) incubating the formaldehyde treated toxin from two to three weeks. The antigenicity of the anatoxin was titrated by Ramón's flocculation test (read in one hour and fifteen minutes). The titer of the serum resulting from the use of anatoxin alone was much higher than that produced by the use of toxin-anatoxin. It was found that hyperimmunization with this anatoxin caused no inconvenience to the animals and resulted in the formation of a very high titer antitoxic serum. Horses not very reactive to diphtheria toxin subsequently immunized with tetanus anatoxin produced an unusually high titer antitetanus serum. Since the subarachnoid route of serum prophylaxis does not permit the injection of more than 20 or 30 cc. of horse serum, the authors commend their antiserum, which contains from ten to fifteen times the antitoxin of serums prepared in the old way.

**Conservation of Complement for Wassermann Reaction.**—Shirvindt and Liberman discuss the various methods for the conservation of complement proposed in the past. The results of methods that included freezing, desiccation, addition of sodium chlorate, sodium citrate, magnesium sulphate and other substances were not entirely satisfactory. The authors incorporated the methods proposed by Ginsburg and Kalinina and by Sonnenschein in 1929. According to one method, 10 per cent crystalline sodium chlorate and 4 per cent crystalline boric acid were added to fresh complement and the serum was stored at room temperature; according to the other method, 10 per cent crystalline sodium acetate and 4 per cent crystalline boric acid were added and the serum was stored at icebox (5 C.) temperature. Twenty-nine samples of complement were conserved by using the first method. One serum was active after eight months' storage, two after six months', the rest after intervals of from thirty to ninety days. Ten more samples of complement were still active after three and one-half months with no change in titer or scarcely any. Three samples of complement were stored, the two methods of conservation being used in parallel, and at the time of the publication of the paper (five and one-half months after collection of the serums) the authors report that the serums are still complementary with but little change in titer from the time of the first collection. The author asserts that boric acid prevents bacterial contamination; and sodium chlorate helps to keep intact the colloid state of the serum. The two methods of conservation seemed equally effective.

## Nederlandsch Tijdschrift voor Geneeskunde, Haarlem

**75:** 4643-4750 (Sept. 12) 1931

Diaphragmatic Hernia of the Hiatus Oesophageus. S. Keijser.—p. 4644.
*Myxedema, Fugitive Edemas, Cachexia Strumipriva and Epilepsy. G. C. Bolten.—p. 4650.
Thrombosis and Infection. P. H. Kramer.—p. 4663.

**Myxedema, Fugitive Edemas, Cachexia Strumipriva and Epilepsy.**—Bolten points out that, associated with myxedema and fugitive edemas, epileptic attacks are occasionally observed. In animals, following complete thyroparathyroidectomy, attacks of epilepsy and tetany develop almost without exception. In man these manifestations have likewise been repeatedly observed after thyroidectomy. These facts lead the author to assume that also in cases of so-called genuine epilepsy, in the sense that Binswanger uses the term, a thyroid or a pluriglandular insufficiency is to be regarded as the cause.

## Finska Läkaresällskapets Handlingar, Helsingfors

**73:** 593-680 (Aug.) 1931

*Sterility in Women: Its Causes and Treatment. E. A. Björkenheim.—p. 593.

**Sterility in Women.**—Björkenheim's 524 cases (424 primary, 100 secondary) include only cases of sterility after at least three years of marriage. In at least 10 per cent of the cases, childlessness was due to the husband. The most common cause of sterility in the wife was inflammatory changes in the adnexa and parametrium (about 35 per cent). The total number of patients treated was 417, of which 69 required interventions which made conception impossible. Of the remaining 348 cases there was information as to the results following treatment in 213: conception occurred sooner or later after the start of treatment in 56 (16 per cent) of the 348 cases.

## Hygiea, Stockholm

**93:** 577-624 (Aug. 15) 1931.

*Endemic Goiter in Sweden. J. A. Höjer.—p. 577.
Critical Considerations Regarding Question of Daily Variations of Urobilinuria. E. Forsgren.—p. 602.

**Endemic Goiter in Sweden.**—Höjer concludes that there is usually a definite relation between topography and simple goiter. Most of the goiter regions in Sweden are found on or below slopes, the incidence of goiter depending on the degree and the length of the slope and the width of the ridge, and on the presence of watercourses. Goiter is frequent in localities lying below mountain masses, mountain ridges, in deep valleys, less frequent below conical mountains and more frequent in the lower part of deep narrow valleys.

## Ugeskrift for Læger, Copenhagen

**93:** 867-886 (Aug. 27) 1931

*Treatment of Bronchopneumonia in Children. E. Lenstrup.—p. 867.

**Treatment of Bronchopneumonia in Children.**—Lenstrup states that in 261 cases of bronchopneumonia, representing all degrees, in which the patients were treated in the Queen Louise Children's Hospital from 1919 to 1929, the total mortality was 14 per cent. The mortality in the first year of life was almost 20 per cent and in the second year it was 8 per cent. The therapy was conservative, the main feature being rest. In cases in infants the steam tent was used extensively and in cases with cyanosis oxygen was administered, always with the steam tent. Medicamental treatment was limited.

## Upsala Läkareförenings Förhandlingar, Uppsala

**36:** 297-438 (Aug. 15) 1931

*Case of Gas Abscess in Pancreas. C. G. Sundberg.—p. 297.
*Displaceability of Pleural Exudates and Method of Roentgenologic Demonstration of Minimal Shifting Exudates. R. Hjelm and H. Laurell.—p. 305.
What Factors Determine Speed of Rise of Pressure in Artificial Venous Stasis? C. Grill.—p. 313.
*Surgical Treatment of Habitual Luxation of Shoulder Joint. S. Ribbing.—p. 321.
Method for Determination of Dosage of Small Quantities of Iron in Organic Substances. A. Wallgren.—p. 329.
*Case of Papilloma on Valve of Heart. A. L. Haglund.—p. 339.
*Specific Infectious Rheumatism: Pathogenesis and Pathologico-Anatomic Differential Diagnosis. S. Gräff.—p. 349.
Question of Airing Hospitals. C. Naeslund.—p. 375.
Vitamin C Content of Bananas and Question of Determining Smallest Antiscorbutic Protective Dose. C. Naeslund.—p. 397.
Formation of Vitamin C with Especial Regard to Significance of Sunlight. C. Naeslund.—p. 411.
Ability of Man to Utilize Vitamin C in Raw and Cooked Vegetables. C. Naeslund.—p. 425.

**Case of Gas Abscess in Pancreas.**—In Sundberg's case the diagnosis of pancreatic abscess, based mainly on the results of roentgen examination, was verified at operation. The formation of the so-called pancreatic pseudocyst, located between the liver and the stomach, is believed to have been due to an attack of acute pancreatitis some months earlier, and the repeated attacks of pancreatitis to incomplete drainage to the duodenum, as demonstrated roentgenologically. The only sign of an infectious process was the increased speed of the sedimentation reaction. Surgical treatment was followed by recovery.

**Concerning Displaceability of Pleural Exudates.**—Hjelm and Laurell state that small pleural exudates not demonstrable in an upright position can often be established when the patient is recumbent, with the affected side downward.

**Surgical Treatment of Habitual Luxation of Shoulder Joint.**—Ribbing gives the case reports of five persons operated on according to the method of Clairmont and Ehrlich and observed for from over one year to almost six years. Reluxation occurred in one case after almost two years and has not recurred subsequently in the period of more than two years. There was no recurrence in the other four cases. The shoulder function was slightly impaired in two cases, and good in three.

**Case of Papilloma on Valve of Heart.**—Haglund's case agrees in the main with the cases of papillary tumors of the heart valves previously described. In this case, however, some of the papillae were grown together.

**Specific Infectious Rheumatism.**—Gräff distinguishes between rheumatism as a clinical symptom and rheumatic nodules due to an infectious disease with a special causative agent. Specific infectious rheumatism, he states, can appear in different clinical manifestations, as acute specific rheumatic polyarthritis, carditis with various subordinate forms, an angina of special form, nodose rheumatism, laryngitis, recurring or chronic arthritis, and myositis, all of which he ascribes to a specific agent as yet unknown. He discusses the forms of specific rheumatic reaction, the views on the character and morphology of "rheumatism," the formal pathogenesis of specific infectious rheumatism, the primary focus, continuous and hematogenic spread, the exciting agent, nonspecific infectious rheumatism, and therapeutic points of view. Six cases are reported.